

THE AUTOMOBILE

57 ENTRIES IN FRENCH VEHICLE TRIALS

AMIENS, FRANCE, Oct. 1—Spurred on by the prospect of government subsidy in addition to the natural and usual advantages accruing to a winner, the French manufacturers have entered the commercial vehicle trials in such numbers as to insure most strenuous competition. Not only have the lists filled well, but the unusual number of 57 entries have been received. These are divided over the three classes of competition, as well as being spread over the other departments relative to governing power. Thus, of the machines entered, 8 are to be submitted to the War Office trials only, 17 to the Automobile Club's requirements, and the remaining 32 to both.

The trials are to be held jointly by the Automobile Club de France and the French Government, as represented by the War Department. This has necessitated the formulation of two separate and distinct sets of regulations for the conduct of the day's trials. This really makes the competition into two contests daily, and under parallel road and weather conditions, but different rules. In addition to formulating a separate set of rules, the War Department has announced a schedule of subsidies to be paid to owners of vehicles which meet with the department's approval as well as with success in the trials. These subsidies are, of course, given subject to the government privilege of

buying the car in case of war, at a prearranged price. In addition, the car must be presented for inspection once each year.

Under these restrictions, successful owners receive from the Government the amount of \$1,200, divided \$600 upon purchase, and an allowance of \$200 per year for three years.

At Versailles the headquarters will be located and the trials, which start October 18 and continue daily until November 15, will begin and end there, each day, when possible. A special central garage for housing the cars has been built there, large



Combination
Tractor and Plow
at Agricultural Trials at
Amiens, France



Rear
View of
Tractor Showing
Plow.

enough to contain all of the cars entered, and fitted with all necessary facilities for doing work upon them.

There are three principal classes for competition, but each class is subject to a further subdivision. The classes are: motor trucks, road trains, and omnibuses. The first is divided according to carrying capacity into various classes, from 880 pounds on up to 6,000 pounds. The second main class has these subdivisions: tractors, freight trains exclusively, and passenger trains. Then, the last class has three sub classes, namely: carrying capacity of from 6 to 10 passengers, 11 to 20 people, and above 20.

Daily trips will be made over two courses, one measuring 62 miles in length, and the other 93 miles. This takes the competing vehicles over all kinds of bad roads, hills, and through conditions intended to test them out very thoroughly. On the third day, a long trip is to be made to Clermont-Ferrand by easy stages, where the cars will be placed on exhibition, returning later to Versailles to continue the tests.

Added interest will be brought out by the compulsory variation in fuels, alcohol, benzol and gasoline being used in turn, and the results with each being carefully noted. Thus, from October 18 to 31, gasoline will be used; from November 2 to 6, carbureted alcohol will be substituted, and for the concluding week, November 8 to 15, the fuel employed will be benzol.

How much of the French excellence in this form of vehicle is due to mechanical superiority and how much to clever exploitation is very hard, if not impossible, to determine, but it is a self-evident fact that the various makers, exploitation to the contrary, are both ready and willing to enter into public competition to prove their assertions. Never has a trial been so carefully planned out, and so many features of the contestants' comfort catered to in advance. In response to this careful and able planning, the promoters (if the Club and the Government can be called that) have been rewarded with the largest and best entry list ever received. Among the entries are the following high class makers, the number of cars entered by each one being given also: Aries, 4; Berliet, 4; Berna, 1; Clément, 4; Cohendet, 2; De Dion-Bouton, 5; Delaunay, Clayette et Cie, 4; Desmarais et Morane, 4; Krieger, 3; Lorraine-Dieterich, 4; Malicet et Blin, 3; Panhard et Levassor, 4; Peugeot, 4; Société de Poids Lourds, 2;

Saurer, 5; Schneider et Cie, 2; Vinet, 2. With this kind of competing vehicles, many of the figures set last year, and in previous trials should be wiped out. Thus, the figures for heavy vehicle economy made in 1905 by a Daimler, carrying 6.8 kilos, at an average of 20.8 km per hour, on .035 litres of gasoline per ton-km, should be displaced. The trials should bring out construction novelties.

SOME SUGGESTIONS TO TOURISTS

A consul who has long resided in a non-English-speaking country and who has seen many instances where misunderstandings and misconceptions, with subsequent unpleasant contingencies which could have been avoided by patience and courtesy, offers the following suggestions to tourists and travelers:

When traveling through a non-English-speaking country, one should remember that it may be extremely difficult for the people to understand what the tourist wishes. Neither should one forget that the customs, tastes and traditions of the people differ from that of the tourist, as a consequence of which the multifarious things and customs which he encounters do not coincide with those to which he has been accustomed. Nor should one expect to be served as punctiliously and satisfactorily as at home, considering his varied environments. In fact, anything which one finds abroad should be given due consideration and, in case of any complaint, an effort made to remedy the matter in a reasonable manner.

This can be easily done through the use of a little tact and common sense. Courtesy is something the public have a right to expect of a tourist. The tourist expects it from all those with whom he comes in contact and almost invariably receives it; then why should he be reluctant to reciprocate this kind attention and friendly disposition on the part of the foreigner?

Through courtesy and its inherent subsidiaries more than through any other characteristic a traveler may not only more easily raise himself, his people and his country in the estimation of the foreigner, but he thereby places himself in a position oftentimes to obtain many favors and concessions from the people among whom he is sojourning which might otherwise be graciously refused.

THE AUTOMOBILE CALENDAR

AMERICAN

Shows, Meetings, Etc.

- Nov. 6-13.....Atlanta, Ga., Auditorium-Armory, National Automobile Show, auspices of National Association of Automobile Manufacturers. Samuel A. Miles and Alfred Reeves, General Managers, 7 East 42d Street, New York City.
- Dec. 31-Jan. 7....New York City, Grand Central Palace, Tenth International Automobile Show; American Motor Car Manufacturers' Association, with Importers' Automobile Salon and Motor and Accessory Manufacturers. Alfred Reeves, General Manager, 505 Fifth Avenue, New York.
- Jan. 8-15.....New York City, Madison Square Garden, Tenth National Show, Association of Licensed Automobile Manufacturers.
- Feb. 5-12.....Chicago, Coliseum, Ninth Annual Automobile Show, National Association of Automobile Manufacturers. S. A. Miles, General Manager.
- Feb. 21-26.....Binghamton, N. Y., State Armory, Automobile Show. R. W. Whipple, Secretary.
- Feb. 22-26.....Kansas City, Mo., Convention Hall, Fourth Annual Automobile Show.
- March 5-12.....Boston, Mechanics' Building, Eighth Annual Automobile Show, Boston Automobile Dealers' Association. Chester I. Campbell, General Manager, 5 Park Square.

FOREIGN

- Nov. 12-20.....London, Olympia, Eighth Annual International Automobile Show, Society of Motor Manufacturers and Traders.

AMERICAN

Races, Hill Climbs, Etc.

- Oct. 5-9.....Danbury, Conn., Stock Car Races in Connection with Danbury Fair.
- Oct. 7.....Philadelphia, Second Annual Stock Chassis, 200-Mile Race, Fairmount Park, Quaker City M. C.
- Oct. 8-9.....Louisville, Ky., Endurance Run, Louisville Automobile Club.
- Oct. 15-16.....New York City, Brighton Beach Track, 24-Hour Race (postponed from September 24), Motor Racing Association.
- Oct. 23.....San Francisco, Road Race, Automobile Club of California.
- Oct. 23-30.....Dallas, Texas, Three-Day Track Meet, Dallas Automobile Club.
- Oct. 30.....Vanderbilt Cup Race, Long Island Motor Parkway, Motor Cup Holding Company.
- Nov. 8-9.....Savannah, Ga., Georgia Highway Reliability Contest to Atlanta, Savannah Automobile Club.
- Nov. 9.....Atlanta, Ga., Track Races, Atlanta Automobile Association.
- Nov. 20-21.....New Orleans, Annual Fall Meet, New Orleans Automobile Club. Homer C. George, Secretary-Manager.
- Nov. 22.....Denver, Col., Start of "Flag to Flag" Reliability Run. G. A. Wahlgreen, Manager.
- Dec. 29-30.....Philadelphia, Fourth Annual Midwinter Endurance Contest, Quaker City Motor Club.
- Feb. 4-6.....New Orleans, Annual Mardi Gras Speed Carnival. New Orleans Automobile Club.

NEW YORK CITY HAS A LOOK AT AERIAL TRAVEL

WILBUR WRIGHT firmly established himself as the popular hero of aviation by two marvelous flights at New York during Hudson-Fulton week. From Governor's Island, on September 29, he sailed out across the bay and circled the Statue of Liberty; and on October 4, again rising from the little island at the lower tip of Manhattan, he took his way up the Hudson River to Grant's Tomb, passing over the warships at anchor, and returned to the starting point calm and smiling as ever. It was done so easily and so quickly that the cityful of spectators stood in a daze, almost forgetting to cheer. Then, at the very moment of starting on another flight, which would have thrown the first two into insignificance, a cylinder head of the motor blew out, and the crowds waited in vain. But the practicability of aerial travel had been demonstrated as never before in the presence of half a million witnesses.

The Hudson-Fulton committee began negotiations with Wright and Curtiss in August, and secured the signatures of both aviators to contracts binding them to make flights in the vicinity of New York. A large tract of made ground on Governor's Island, the military station, was set apart as an aviation field, and sheds were erected to house the aeroplanes. Wright arrived in New York September 19, and Curtiss two days later. Both quickly had their machines ready, but rain and high winds prevented the trials for several days. Curtiss was the first to take the air.

At 7 A.M., September 29, he made a short flight about one minute in duration, returning to his starting point without trouble. He postponed further attempts to fit a new propeller.

Wright arrived on the island soon after the Curtiss machine had been taken back to its shed, and after a short inspection brought out his flier. Pointing the machine directly into the wind, he ran lightly along the starting rail and went easily into the air. Two circuits of the filled-in ground were made, and then the machine headed straight out over the water. It flew over two tugs at a height of 100 feet, turned up Buttermilk Channel, and coming abreast of the upper end of the island, turned back again in full view of the crowds on the Battery sea wall. It landed rather abruptly, but without damage, having been in the air altogether 7 minutes 10 seconds. Then instead of tak-

ing the machine back to the shed, Wright had it again placed on the rail, and after an hour spent in looking it over, he climbed into the seat. The start was even quicker than before, and after a short circuit of the ground at a height of 30 feet, he turned out over the bay, headed straight for the Statue of Liberty. The crowd set up a mighty shout.

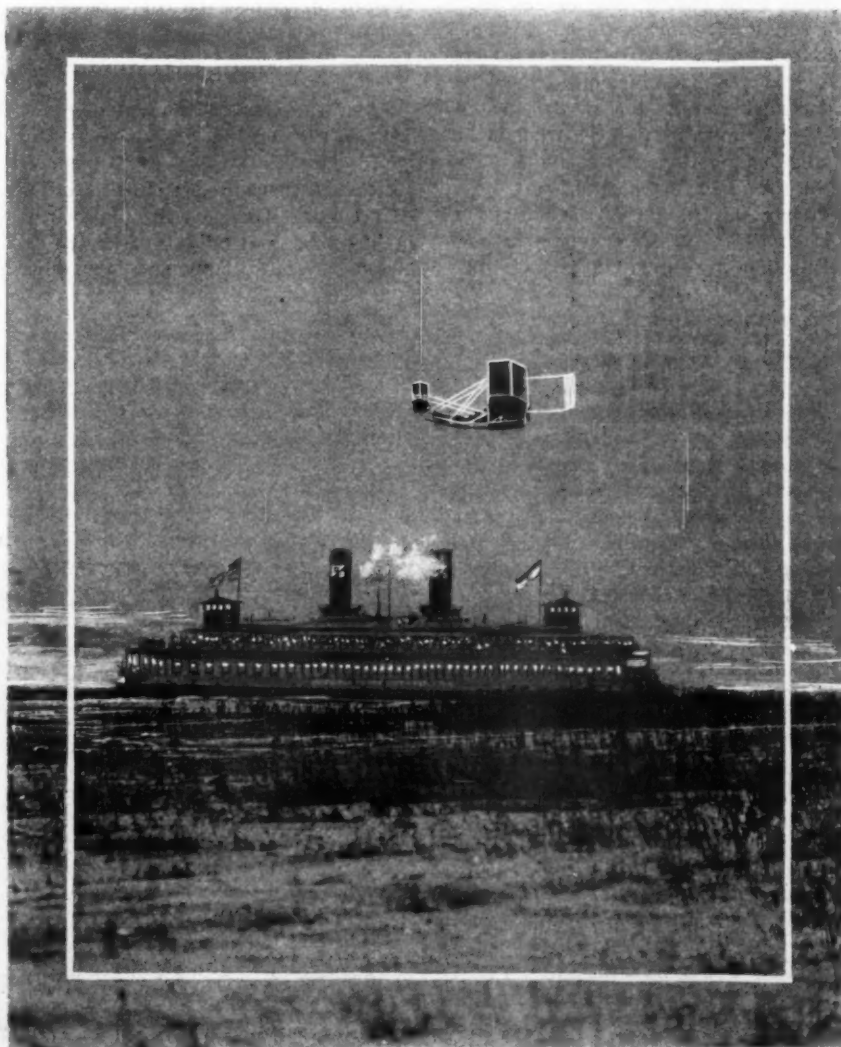
With three or four long rolls, like a ship at sea, the flier rose some 200 feet in the air. It sailed smoothly on; came abreast of the statue, and passed it. Over the narrow strip of water between Bedloe's and Ellis Island Wright brought it around in a magnificent sweep, his silver-planes inclining gracefully. He circled back to the goddess on the south side, passing over the breakwater of the island and within twenty-five feet of the statue, at the height of its waist. At this moment the *Lusitania* came in sight, outward bound down the bay. Her decks were black with passengers, but the roar of the whistle drowned their cheers. The flier crossed her bows only 150 yards distant. Six minutes 40 seconds after the start the aeroplane settled gently on Governor's Island, and Wright stepped out, clearly pleased with his trip.

Late in the afternoon the flier was again brought out. The wind was now blowing twenty miles an hour, and the spectators could not believe that Wright was considering another ascension in such weather. Nevertheless the aeroplane was set on the rail

and started off. It made three circles over the island and the bay to the south, often heeling over sharply in the wind, and landed without mishap. Many thought this flight the most remarkable of the three.

A period of unfavorable weather prevented further trials till October 4. That day, which was to be the climax of the week, dawned bright and clear; flags drooped from their staffs, and from the chimneys smoke rose in straight columns. It had been announced the day before that a flight was probable, and the city was on the lookout.

The aeroplane left Governor's Island at 9:53 a. m., and immediately headed out over the water. For a time it was lost from the sight of those on the island in the smoke of a harbor boat; when it reappeared it was bound straight up the Hudson at a height of 75 feet. The whistles of



Wright Starting from Governor's Island on Memorable Flight



Wilbur Wright and His Epoch-Making Aeroplane—The Canoe Was Carried in Case of Fall Into the Hudson River

tugs and ferryboats set up a deafening chorus, warning the whole city. Little work was done downtown that morning. Opposite the Singer tower Wright rose 200 feet in the air, but at Fulton street he swooped down, resuming a straight course at about half the former altitude and nearer the Jersey shore. Riverside Drive was lined with spectators as he passed, and the sailors on the foreign warships turned out to man the yard-arms. He had now come over to the New York side, and passed Grant's Tomb at 10:13, only 200 feet off shore. He made his turn around the British cruiser *Drake*, a thousand feet to the north, and returned on the Jersey side. Going down, he had the wind in his favor, and at 10:26:33 he alighted on Governor's Island. The distance was 20 miles, and the time 33 minutes 33 seconds.

Preparations were immediately started for another flight in the afternoon, which was to be up the East River, under or over the bridges, and possibly clear around Manhattan Island. Just

before 4 o'clock the motor was started, and Wright turned aside for a moment. Suddenly there was a muffled explosion, and a piece of metal shot through the upper plane and fell within a few feet of the aviator. It was the head of the forward cylinder of the motor. The whirr of the propellers died down. Wright glanced at the ruin; then dropped his arms to his side and turned away. The flights were over.

Dirigibles Fail to Fly to Albany

The dirigibles of Capt. Baldwin and George Tomlinson, which were to race up the Hudson to Albany for a \$10,000 prize, both failed signally. After several postponements, they started, September 29, from the station at 120th street and Riverside Drive, near Grant's Tomb. Capt. Baldwin's steering gear broke after he had gone four miles, and he fell in the river. Tomlinson got as far as White Plains, and came down in a field.



Captain Baldwin's Dirigible Starting from Riverside Drive, September 29, for Albany, in the \$10,000 Prize Race

SELDEN DECISION BRINGING STARTLING RESULTS

**Eight Big A. M. C. M. A. Concerns Will Be Affiliated with the A. L. A. M.,
with More to Follow—Ford May Continue the Contest—
General Motors Company Situation in Doubt**

DEVELOPMENTS of the past few days and attendant possibilities of the near future indicate that the recent Selden patent decision will bring about startling organization changes in the automobile industry. Following the decision of Judge Hough came the information that the Association of Licensed Automobile Manufacturers would undoubtedly take a broad view of the situation and not attempt anything which might prove detrimental to the industry as a whole. There has seemed to be a realization on both sides of the patent litigation that the present extraordinary demand for automobiles is inducing manufacturing preparations of such proportions as to arouse fears of a dreaded over-production and more or less disaster to all concerned, including those firms who bore the brunt of experimental expenses in the early days, when the making of motor-driven vehicles proved somewhat unprofitable.

That Important Conference at Buffalo

First of the moves in a new alignment of concerns was a meeting held in Buffalo on Wednesday of last week, at which were present H. O. Smith, of the Premier Motor Manufacturing Company and chairman of the A.M.C.M.A. committee of management; Benjamin Briscoe, of the Maxwell-Briscoe Motor Company and ex-chairman of the A.M.C.M.A. committee of management; C. G. Stoddard, of the Dayton Motor Car Company and vice-chairman of the same committee; R. E. Olds, of the Reo Motor Car Company; Charles Lewis, of the Jackson Automobile Company and another member of the committee; William Mitchell Lewis, of the Mitchell Motor Car Company, besides Mr. Mathews, of the Jackson company, and Mr. Bates, of the Mitchell company.

It was a natural sequence that a representative of the A. L. A. M. should be more or less present during the somewhat prolonged session. One question propounded to him was whether the A. L. A. M. would take in the A. M. C. M. A. as a whole, and the reply was that each company would have to make separate application and fulfill the conditions imposed.

New Conditions of Licensed Membership

Covering all cars delivered and sold since 1903, new members will be asked to pay eight-tenths of one per cent., same being based upon the list prices of the cars at the time of sale. It is understood that the Licensed representative had power to offer specified conditions, but no authority whatever to change them in any particular.

These concerns are understood to have decided at the Buffalo meeting to qualify for A.L.A.M. membership:

**Maxwell-Briscoe Motor Company
Reo Motor Car Company
Premier Motor Manufacturing Company
Mitchell Motor Car Company
Dayton Motor Car Company
Regal Motor Car Company
Jackson Automobile Company.**

It was only a couple of weeks ago that the Willys-Overland Automobile Company vaulted the fence into the Licensed field by absorbing the Toledo Motor Company, which held a Selden license. This gives a total of eight A.M.C.M.A. concerns on the Licensed roll call.

Respecting future applications from the A.M.C.M.A., only such other companies as may be recommended by the above

concerns, and only those which have built cars on a considerable scale, will be considered for membership by the A. L. A. M.

To Prevent Possible Over-Production

Once the A.L.A.M., after a reasonable length of time, concludes its consideration of new members, the indications are that it will proceed against all the remaining concerns, and insofar as it is possible so to do, will prevent the many newcomers from an over-production which would flood the market disastrously.

In a letter sent out by the chairman of the A.M.C.M.A. executive committee following the meeting at Buffalo, the concluding paragraph read as follows:

"It seems to be the general opinion of those present (referring to the Buffalo meeting) who had conferred with their patent counsel that the hearing on appeal (referring to the Selden case) would probably occur at a comparatively early date, and, if confirmed, the position of the Licensed association would be such that it would control the situation."

If this statement represents the present general view of the unlicensed makers, in the face of all the legal talent that has been employed in the Selden case, it is not difficult to understand why eight important makers have already decided to enter the Licensed fold.

What Henry Ford Will Decide to Do

Up to the time of going to press the only news available from the Henry Ford camp was to the effect that his company would continue its independent course, though both the head of the concern and Vice-President James Couzens have had various conferences in New York City, where all the leaders of the industry are now gathered.

An impression prevails that Mr. Ford will hold out, rather than pay at this time the large sum which would represent back royalties.

If Ford appeals, it is contended by some, the measure of damages cannot be more than the eight-tenths of one per cent., which is the basis of agreement as between the Licensed association and the companies already as good as taken in. Others say that the measure of damages will be more, because the royalty has been all the way from five per cent. down, it having been reduced from time to time. But it is pointed out that there were but few Ford cars built during the time when the higher royalty was in vogue, and if Ford puts up a fight, all he has to risk is the cost of the appeal and defending the suit for damages which must be brought before the Licensed association can spend any of Ford's money. This will be true if it is a fact that the measure of damages is now fixed by the agreements made with the companies that have accepted the Hough decision as final.

The Situation of the General Motors Company

A decidedly interesting phase of the present situation relates to General Motors, now comprising Buick, Oldsmobile, Cadillac, Welch, Rainier, Oakland, Reliance, and Rapid, with W. C. Durant as the man in the saddle. It will be remembered that last Winter, when the combine of which he is the head only included Oldsmobile and Buick it refused to continue paying royalties, since which time a suit has been pending in the courts. Mr. Durant is on the ground, but whether he wants to renew his Licensed affiliations or whether he will be permitted to do so even if he is willing, are questions yet to be answered.

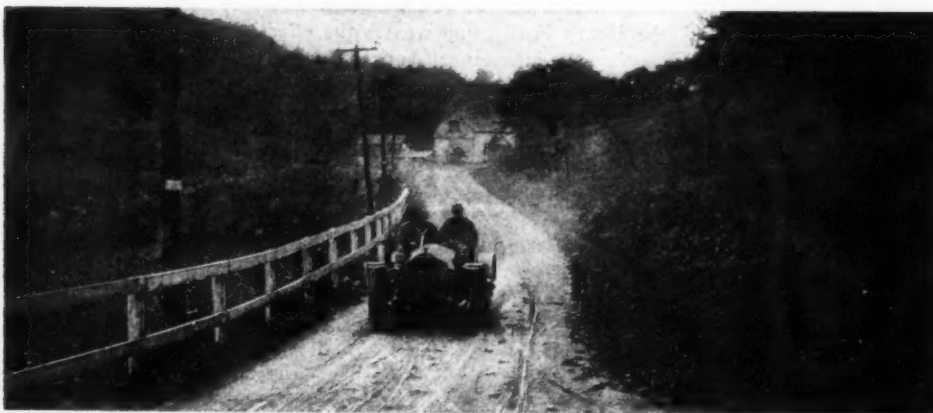
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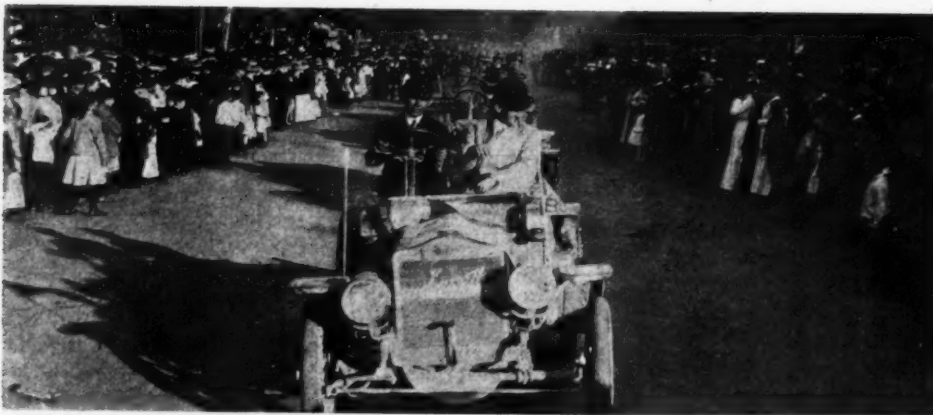
Elmore, Two-Cycle Winner, Only Survivor with Clean Score



Renault, the Foreign Car Participant, Winner of Its Class



12 Pullman Which Was Most Successful in Division 3



Maxwell "Q" Which Took the Honors in Division 2

TWO-CYCLE ELMORE

WASHINGTON, D. C., Oct. 2.—Two-cycle Elmore survived the Munsey reliability contest with a flawless record, thus winning the sweepstakes prize for the car making the best score in the tour, and at the same time winning the trophy offered in the \$2,001 to \$3,000 division. The car was driven by Frank Hardart, Jr., son of the entrant, and hailing from Philadelphia. While a protest has been filed by Ray W. Harroun, it is far from probable that the technical committee will have its findings revised by the contest board of the A. A. A. Harroun drove No. 30 Marmon, which was penalized only seven-tenths of a point. Here is the complete list of winners:

Class.	Points.
\$4,001 and over...	
No. 28, Renault.....	4
\$3,001 to \$4,000	
No. 21, American Simplex....	9
\$2,001 to \$3,000	
No. 36, Elmore.....	0
\$1,251 to \$2,000	
No. 12, Pullman.....	62.3
\$851 to \$1,250	
No. 9, Maxwell.....	29.
\$850 and under	
No. 7, Ford	6.

The trophy in division 3 was originally given to the Crawford, but the fact that a front wheel was replaced the first day, which did not appear on the observer's card, gave the car a greater penalty than first appeared. This made No. 12 Pullman the winner of this division, but the award of the trophy to this car has been protested by the Carter Motor Car Corporation, of Washington, entrant of No. 5 Washington. The basis of this protest is that the Pullman, which sustained a broken spring, could not replace it for \$2, as claimed. No. 5 Washington had 68 points against it.

The entry of the travel-stained motorcade into the National Capital was on the order of a triumphal progress from the time the limits of the district were reached until the cars drew up in front of the Munsey building. A parade was formed on the outskirts of the city with a quartet of United States Army buglers in the van. Half a hundred escorting cars followed the 25 cars which had participated in the run, and when Pennsylvania avenue was reached the crowd was so dense that the lines of police who were on hand to keep the crowd in order had all they could do to maintain a passageway for the procession. Each car and driver was lustily cheered by name as it finally checked in and was sent off to the official garage, where it was immediately put through the

PERFECT SURVIVOR

brake, clutch and other tests preliminary to the final technical examination. The "can't-lose-me" Autocar truck reported at 8.30, having left Philadelphia three hours after the run.

Wednesday night the tourists were entertained at Belasco's Theater by "The Yankee Girl." Thursday's program included a monster floral parade in which the contesting cars with their mud and grime shared interest with the many beautifully decorated machines which contested for prizes. From 8.30 until midnight the tourists were entertained by a smoker in the red room at the New Willard Hotel, during which the results of the run were announced and trophies presented.

The tour was a big success in many ways notwithstanding the bad weather encountered during the greater part of the time. The rain and mud played havoc with some of the cars, and of the original twenty-five starters but twenty of them completed the tour. The tourists received an ovation in Philadelphia and Baltimore on the return trip and their entry in Washington was the occasion of the greatest outpouring of people since the inauguration.

Why Penalties Were Imposed

The Ford received a total penalization of 6 points, of which 1.4 points were sustained for carburetor trouble the first day and .3 point for stalling the motor that day. On the second day .2 point penalty was again levied for stalling the motor twice and .1 point for adjusting the carburetor. In the technical examination the car lost .2 point for a loose right rear fender bolt and loose bolts on the right and left transmission arms; .5 point for a loose extension muffler pipe; .1 point for a loose nut on the driving shaft; .2 point because the muffler cut-out stuck open, and 3 points because the front wheels were loose.

No. 29 Hupmobile, the other entrant in division 1, was listed as finishing as a non-contestant, but the driver objected to this procedure, stating he would prefer to have the car's score made up rather than have it placed in the non-contestant division. The Hupmobile sustained an accident coming out of the garage at Willimantic, which made it late in reaching Washington. R. W. Keeler, the driver, drove the car from Willimantic to Washington without stop, finishing at 10.30 o'clock, September 30. Referee Trego is now figuring out his score.

The model Q Maxwell, winner in division 2, received a total penaliza-



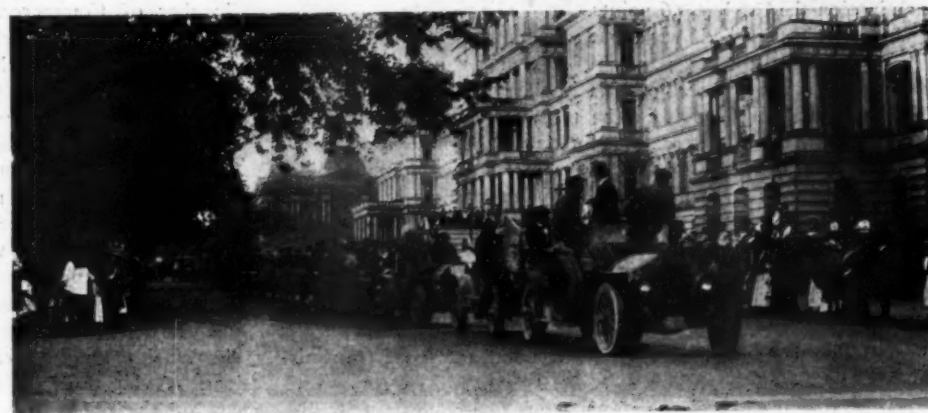
American Simplex, a Two-Cycle Performer, Prize-Taker in Division 5



Ford, Winner of the Smallest Class of the Contest



The Autocar Delivery Wagon Which Finished Strong



All Survivors Participated in the Floral Parade

tion of 29 points. This car had a perfect score up to the seventh day, when Lambert stalled the motor, receiving .1 point, while on the ninth day .2 point was received for a loose magneto wire. In the technical examination .5 point was assessed for a loose right front wheel; .1 for a loose left front lamp bracket; 4 points for the coming off of a rear axle truss rod and 6 points for work on same; .1 point for loose muffler extension; 12 points because the rear universal joint was badly worn and 6 points for work on same.

The Reo in this division lost 94.3 points, of which 27 points were lost on the road and the remainder in the final examination. The latter penalties consisted of 20 points for play in the steering wheel; 34 points for a wornout steering knuckle and 12 points for work on same; .2 point for lost radius rod bolt and .5 point for replacing same; .1 point for a loose right rear spring clip and .5 point because the drive chain was too loose. The car was a 1908 model that had been driven 15,000 miles by its owner.

No. 12 Pullman, winner of division 3, lost 62.3 points; the Crawford, 71.9 points; No. 5 Washington, 68 points. No. 31 Washington lost 438.7 points, divided as follows: .1 point for stalling motor the first day; .1 point for tightening pump the second day; .2 point for stalling the motor twice and 31 points for being late in the final control the third day; 358.1 points for work done and for being late the fourth day; .3 point for stalling motor three times and .1 point for work on rear mudguard the seventh day; .1 point for stalling motor and .4 point for tightening front fender the ninth day. This car lost 48.3 points on the final examination for play in the steering wheel, loose front and rear mudguards, broken rear axle truss, crushed muffler exhaust pipe, loose magneto ribs, play in the fan bearing and a leaky water-pipe joint.

No. 32 Washington received 1,555.6 points, 1,451 of which were received the fourth day, when accidents to the car delayed its arrival in Boston many hours. The car lost 74.6 points on the final examination.

In division 4 the Chalmers-Detroit drew a total penalization of 51.2 points, of which 49.2 were the result of the technical examination and 2 points for stalling the motor twice and work done on the road. The technical examination developed a penalty of 7 points for a broken right front mudguard brace, .2 point for loose spring cleats; .1 for loose right front fender; .5 point for play in the left front wheel; .1 point for loose fan bearing; .6 point for loose rear fenders; .2 point for lost nut off fanshaft pulley, 35 points for a badly broken subframe in the rear of the transmission; .1 point for loose right front engine arm bolts.

Six and three-tenths points was the score of the Spoerer. On the first day this car was penalized .3 point for oiling the clutch, while on the seventh day 3.2 points penalty was incurred, of which .8 point was for removing wires from and adjusting the magneto; 1.6 point for adjusting the timing rod and .2 point for cleaning the carbureter. On the ninth day the motor was stalled twice, which added .2 point. In the technical examination the car lost 2.6 points.

The Corbin finished with 662.1 points against its record. No. 20 Winton lost 5.5 points, of which 1.1 point were sustained on the road and 4.4 points in the technical examination. The Marmon lost .6 point in the technical examination and .1 point for work on the road. No. 13 Pullman was penalized 10.7 points, of which 9.9 points were on the final examination.

The American Simplex, winner of division 5, lost but .9 point. On the second day the driver stalled the motor, which cost .1 point. In the technical examination the car lost .8 point.

The Renault came through with but .4 point marked against it, winning division 6. The penalties consisted of .1 point for adjusting hub cap, .1 point for loose spring cleats, .1 point for loose leather boot on universal and .1 point for loose transmission oil stud.

The Maryland and Columbia finished as non-contestants. Both received severe injuries that put them out of the running. The

Matheson was disqualified in New York when the driver put the car in the Matheson garage unattended by an observer.

The two Croxton-Keetons were withdrawn, No. 17 at Williamantic and No. 16 in New York; No. 37 Pullman was withdrawn in Albany and the Selden in Philadelphia.

Details of Harroun's Protest

The protest filed by Harroun is set forth as follows:

"The penalizations against the Marmon, in my opinion, were on technicalities which should have been considered negligible, considering the amount of leeway given all contestants. The Elmore, in my opinion, finished the contest with defective brakes, which was demonstrated by the fact that this car ran into the Marmon when approaching Washington. During the excitement of the moment the driver of the Elmore made the remark that he 'had no brakes' as his excuse for the incident. Furthermore, the Elmore had a very noticeable dish in the left front wheel, showing that the spindle was badly bent. During the latter part of the tour the Elmore had a bad knock under the bonnet, which was very noticeable when the car was standing still and the engine running.

"I claim that the penalization given me of 0.1 point on the road score for removing and replacing the filler cap of the radiator while the car was in motion; 0.5 point for a very slight perceptible shake in the right front wheel bearing, and 0.1 point for what I consider an allowable play in one spring cleat, should not have been made against the Marmon."

Why the Croxton-Keeton Cars Were Withdrawn

Editor THE AUTOMOBILE:

The Croxton-Keeton entries in the Munsey reliability tour went through as far as New York City on the return with the following scores, as you have undoubtedly noted: The 45 horsepower German type arrived at New York with a perfect score, and the 30 horsepower French type was penalized four and one-half points for breaking an unessential bolt.

Our vice-president, Mr. Bernhart, was threatened with a very serious illness on account of the wet weather encountered, and at the arrival of H. A. Croxton, the president of our company, conditions were such in our New York branch that they demanded the immediate use of these entries for demonstration purposes.

Having covered all but the last two days of the reliability run, we had proved all that we wished to prove in respect to endurance and speed under unfavorable weather conditions and rough roads, and as they were the only cars available for demonstration in our New York branch, Mr. Croxton gave orders for an immediate withdrawal from the tour, and placed the cars at the disposal of J. P. Stoltz of the Croxton-Keeton Motor Company of New York City.

Massillon, O.

THE CROXTON-KEETON MOTOR CO.,
S. W. CROXTON, JR.,
Publicity Manager.

Floral Parade Will Be an Annual Affair

Washington turned out en masse Thursday to see the automobile floral parade arranged by the Chamber of Commerce. The great outpouring of people to witness the pageant was a revelation to the promoters of the parade, and it has been decided to make the event an annual affair.

The grand marshal of the parade was W. D. West, president of the Automobile Club of Washington. The cars that competed in the Munsey reliability tour headed the parade, and the drivers received an ovation all along the line.

The sweepstakes prize, a \$600 rose bowl, donated by the Chamber of Commerce, was won by a float entered by employees of the Naval gun factory. The vehicle was a 5-ton Studebaker truck, which was decorated with American Beauty roses and laurel leaves.

The first prize for cars decorated with natural flowers only was won by Harry Wardman, whose Pope-Toledo was designed as a Venetian gondola and decorated with pink and white chrysanthemums. The rose-decorated Waverly electric of Mrs. T. B. Spence was an easy winner in the class for flower-decorated electric machines with women drivers. The car was fashioned in the shape of a huge basket filled with pink roses. The first prize for the handsomest floral decorated cars in the gasoline division was won by the entry of the Auto Livery Co. The Washington Post carried off the prize for the most unique float. A big Packard truck was utilized to form the upper half of the globe, upon which were traced America, Europe, Asia, Africa and the north pole in Southern smilax.

SPECIAL MACHINERY USED IN MAKING AUTOMOBILES

By Thos. J. Fay

QUANTITY is measured, not only in terms of the life and efficiency of a unit, but with reference to the interchangeability of parts, so that when repairs are to be made, the delay will not be long. One other point: a repair part, when substituted for a worn out part, should fit so nicely that the recovered situation will be as good as new.

It is one thing to make one good automobile, but it is quite another matter to make them in quantity and have them all alike, with every part so closely held that repairs can be made by the simple expedient of sending for the part and inserting it in place when it is received without any machining or fitting.

The first difference to be noted as between "foreign" cars and the home product lies in the very chance that no two of them will be alike. This is due to a surplus of cheap labor, and the absence of jigs, special tools and gauges. It is generally well understood that special tools reduce the labor account, and in countries where labor is cheap this way of going about the manufacture of automobiles is ignored in order to save the enormous cost of the special tools.

One important point is overlooked—interchangeability is absent—and no matter how good the material may be, or how well a car may run, if the parts cannot be removed when broken and then replaced the cost of making repairs will be high. Even this phase is not of such great importance abroad, for if there is plenty of cheap labor to do the original work there is also a surfeit of the same class of labor to make repairs. The change in scene from Continental Europe to the United States, with far inferior roads, changes the situation very much. Since the liability to accident is greater, more stress must be laid upon the matter of replacement of damaged parts. In this respect the cars built on the other side by means of the over-plentiful cheap labor are at a disadvantage. The best of materials avail little if repair parts show the human failing of differing slightly from the piece originally used. So it is that the tendency abroad to economize on shop tools and special machinery while the supply of labor continues abundant has brought home to the American manufacturer all the business that he can handle. If but to encourage home manufacturers after their investment of millions

in special machinery, cars made on this side should be given the preference.

This is the story of the difference between the foreign and American automobiles. Although slightly tinged from their viewpoint by the supposedly superior materials available, it is enough to point out that the American maker who will spend hundreds of thousands of dollars to equip his shop with "duplicating" machinery will be just the maker who will go to Japan, if necessary, for the material requisite to accomplish his task.

Labor Saving Is but One of the Purposes—We hear so much of the labor saving idea that most of us fail to remember that there is a second and stronger reason for using special machinery in a shop. Remembering, however, that it is of far greater importance to be able to duplicate parts than it is to save a little labor, it will be profitable to enter a shop and see how the multiple task is performed.

Take an Elmwood Avenue car, and after a pleasant ride through one of the most beautiful sections of Buffalo a broad expanse of buildings of the most modern "concrete construction" will intercept the line of vision on the right hand side. It is the plant of the Pierce-Arrow Motor Car Company, makers of the Pierce-Arrow. The entrance is imposing, and the uniformed attendant at the entrance will politely direct the visitor to the reception room. The first impression is that the management is alert, wishes to consider the comfort of the visitor, but the scheme is far deeper, as we shall presently see. The real inside of the situation is that workmen cannot do the finest grade of work without light, heat and ventilation, and as a matter of fact, the visitor when he enters the reception room is treated with precisely the same consideration as the blacksmith, the machinist and the artist who are responsible for the body creations used on Pierce-Arrow cars. Everywhere is light, with ample provision for heat, and sanitation has a place in the plan.

It might be said this is not relevant to the subject but, really, the first requisite is to have a suitable place to house the special tools and the men who must direct them. In the old days, before pyrometers came into vogue, forges had to be placed in a dark room, in order that the "smith" might be able to judge of

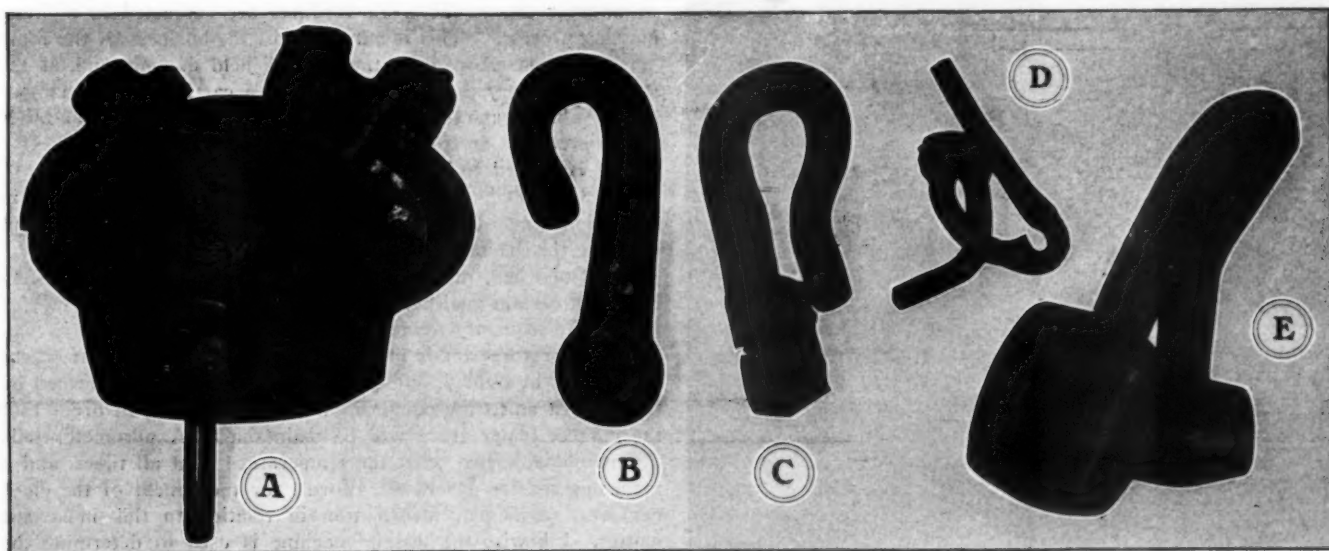


Fig. 1.—Drop forgings bent to illustrate the good effect of annealing, and of heat treating in other ways

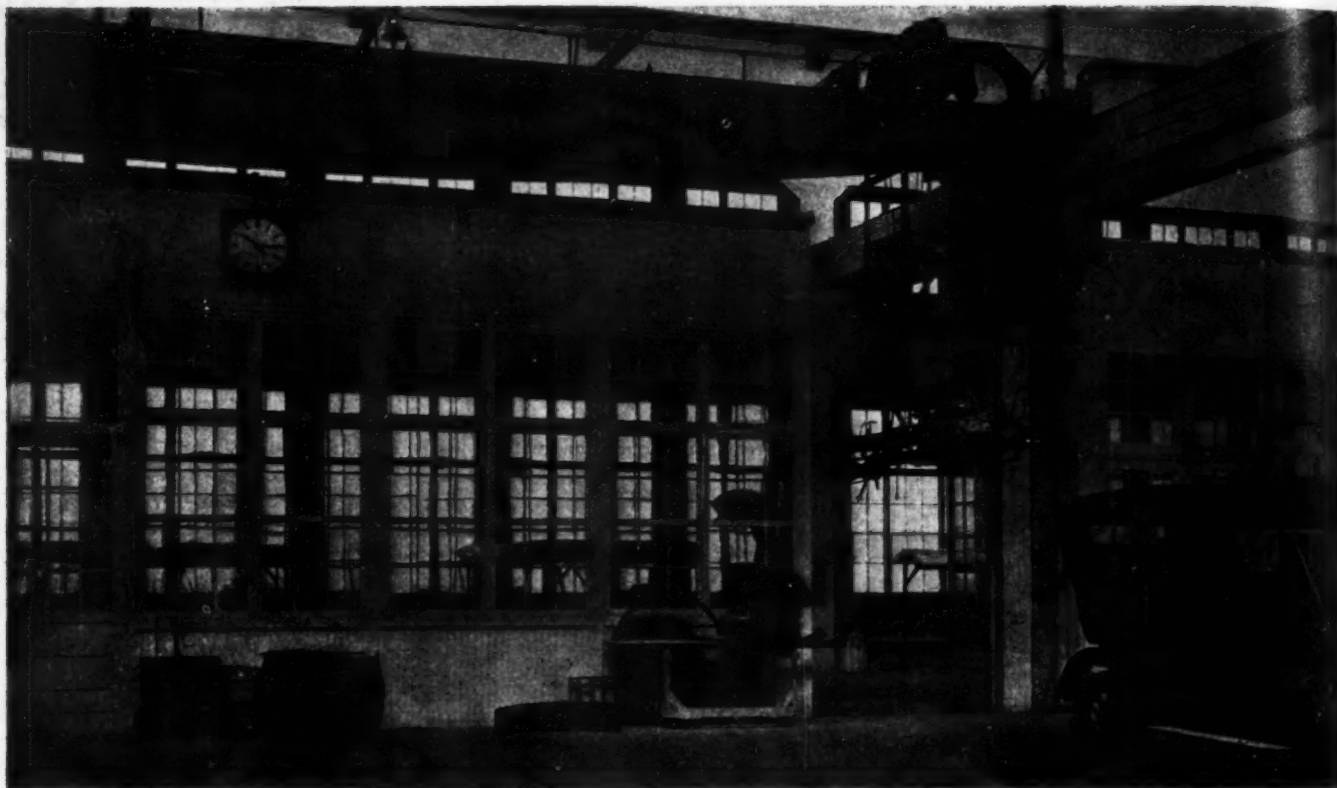


Fig. 2—Traveling crane used to eliminate dead labor and reduce cost of handling heavy units

the temperature of heated work, merely by the color. With pyrometers to tell the story in a much more accurate way, the dark forge is no longer a necessity, and the level of the "smith" is increased until to-day he is one of the most important men around a plant in which fine automobiles are evolved.

What the Forge is Reduced to—Where once the "smith" fashioned parts to intricate shapes by hand, using a fire, an anvil and a certain showing of muscular energy, the heat treatment of parts is substituted for the most part. The parts are made in dies by drop forging, or in a hydraulic press. As they come

from the process they are not fit to use, due to the high heat at which they are drop forged, hence they have to be heat treated, which consists of annealing, heating, subsequent quenching, etc., depending upon the quality of the material used and the duty it is to perform.

Fig. 1 shows just such parts, and A represents one which was experimented upon to bring out the point here to be made. An inspection of this part will show that the bent-over arm fractured near the end and developed a fissure besides. This bending-over process was conducted before the forging was heat treated, and just to show that this condition of irresponsibility could be eliminated the forging was then heat treated, after which the arm was subjected to the same bending process, with the result that the part shows no sign of fracture or distress.

Glancing again at Fig. 1, B, C, D and E will disclose more of the results that follow heat treating. In the Pierce plant, in order to uncover the surfaces, all forgings are subjected to a "sand blasting process." This is but a part of the business of the room or department where once the "smith" held domain, and, as the story goes, every part that now enters a car is suitably manipulated. This means that it must be subjected to one or the other of the processes as follows:

(A) Annealed to remove internal stresses.

(B) Cemented, to grow a deep surface coat of carbon, in order that it may be rendered strong and hard of surface, without reducing the dynamic ability of the soft core.

(C) Quenched, in oil or water, according to requirements, to bring out certain qualities.

(D) Subsequently tempered to accentuate kinetic ability.

The laboratory stands in the shadow of the department where parts are heat treated, and the foreman is carefully informed by the chemist as to the composition of the material, in order that the correct temperature will be maintained. A pyrometer tells the manipulator just what the temperature is at all times, and a recording master pyrometer affords, for the benefit of the chief engineer, permanent information in relation to this important matter. Likewise the testing machine is used to determine the degree of benefit derived, and in these several ways the quality of the steel is exactly determined.

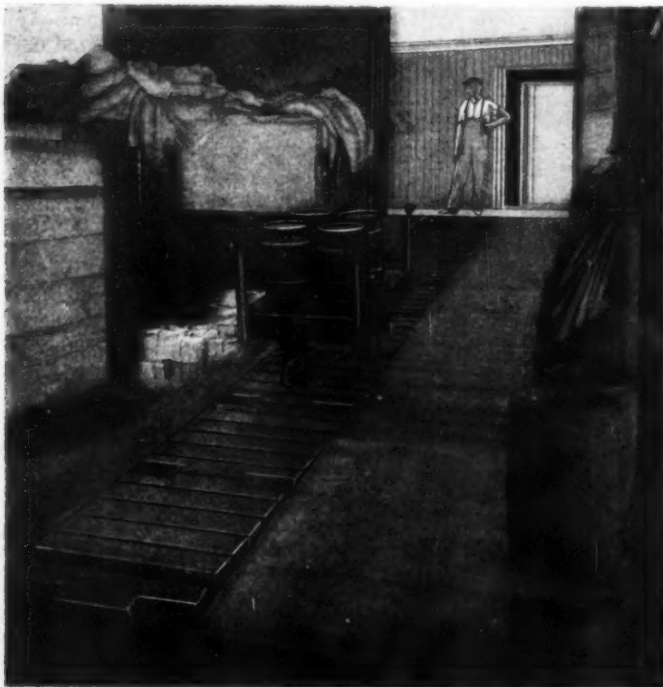


Fig. 3—Moving platform for handling supplies with or without a truck

Many Parts are too Heavy to Lift—The elimination of common labor, which ranks on the "cost system" as dead labor, is necessary if the product is to be up to a fitting standard and have a price tag which will not be too high. Since many of the parts have to be moved about and are heavier than a machinist or a fitter could be expected to lift, it would require the use of common labor were it not for the presence of traveling cranes, one of which is shown in Fig. 2, which spans the erecting shop and is used to move the units quickly under the guidance of one skilled man, and at the beck of the men who do the work, thus placing one machine of great range and ability at the disposal of the men of skill instead of a horde of common labor.

A traveling crane is not easy to arrange in the loading shed where the freight cars are backed in on a siding to deliver materials. Fig. 3 shows how the Pierce engineers disposed of this rather troublesome matter, and it will be observed that the moving platform depicted is so contrived that materials may be dumped on it, to be moved in or out, or trucks may be run on to the platform and up the incline to the cars outside, or down the incline, to the floor inside.

Insight into Some of the Processes—If the name of the maker is to be on the hub-caps of the cars it is important to

have it engraved on in such a way that it will present evidences of taste. It is not possible to have this work done in the foundry by means of letters on the patterns and comply with the requirements. Fig. 4 shows how the work is done in the Pierce plant by means of a machine operated by a man who could not possibly engrave the name on the hub-caps, yet even so, by aid of this ingenious machine the man is enabled to accomplish the task. The process is simple and consists of a platen on which a master engraving rests; a chucking vice holding



Fig. 4—Process of engraving names on hub caps, thus saving cost of skilled engraver, and producing identical results

the hub-cap; a system of parallel motions, so contrived that a pointer which the operator moves over the master plate directs the engraving tool (an end mill suitably ground and shaped) over the hub-cap. The graver imitates whatever figure is on the master plate and all that the workman has to do is to follow the design.

More Important Work Done With Equal Ease—In interchangeable work there is no part of an automobile that can be regarded of such great importance as cylinders. They have to be made of cast-gray iron, and they are subjected to high and variable pressures. If they are not interchangeable the cost of a replacement will be very high indeed. Fig. 5 depicts a big multiple milling planer used for facing off the cylinders, and with nine milling spindles so disposed as to accommodate as many milling cutters, two sets of twin cylinders are faced off at a single setting. Considering the use of high-speed cutters, maintained in the best possible shape by competent men who do no other kind of work, the finished cylinders are accurately raced and interchangeability is accomplished. As an incident the work is done quickly, and, considering the accomplishment of the main task, the cost is not excessive.

The same figure shows how the cylinders are held in a fixture, the object of which is to eliminate the personal equation, pre-

venting the workman from setting up the cylinders excepting in a way to afford the desired results. It is equally advantageous that the time of setting up the work is much reduced, considering the desire to have all cylinders exactly alike, in order that a repair will be easy to make if the occasion requires.

In the process the milling cutters rotate, due to the use of gears which engage a driving

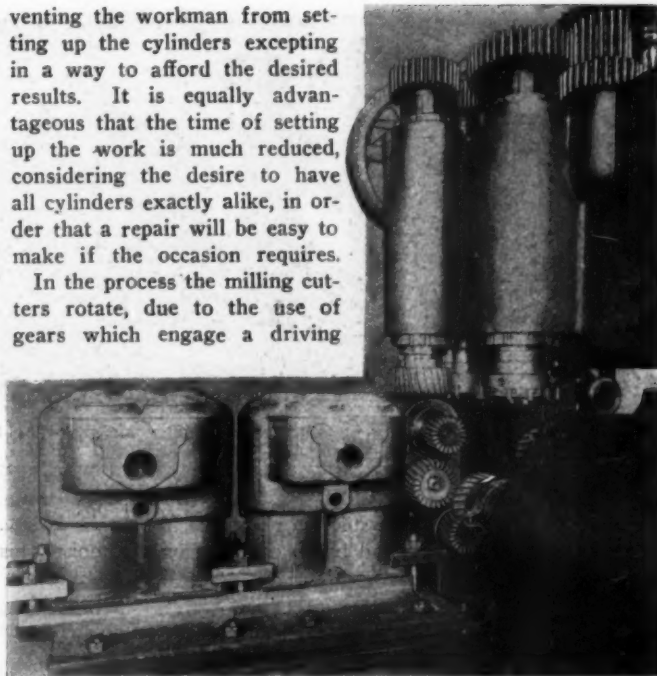


Fig. 5—Milling planers engaged in facing two sets of twin cylinders, and engaging nine milling cutters simultaneously

shaft, through a speed changing gearset. This takes power from an individual electrical motor which is bolted to a base cast on the frame of the planer. The platen on which the cylinders rest has a power feed, and it moves the cylinders up against the rotating cutters at the required speed.

Big Turret Lathes Perform Intricate Tasks—Fig. 6 shows a drop forging which incorporates into the live rear axle for the finished car. The extending arms on this piece, to hold the brake fulcrum pin, render the part a difficult one to machine, which trouble is accentuated on account of the fine quality of the steel used. Chucked in a turret lathe of great strength and range, this task is reduced to practicability, and with six fixed tools on the turret the workman is enabled to do six separate operations at a setting, thus eliminating the error which would surely follow if the part had to be chucked six separate times. In this case the work rotates and the fixed cutters feed (with the turret) up against the rotating work, performing the operations to a nicety. As each operation is done the turret is swung back, a new tool is turreted into range, the feed is thrown in, and the next operation is performed. In this way there may be as many operations as there are fixed tools on the turret, and the work will be as accurate as the tool department keeps the cutters, which, in a shop of this character, is so close that interchangeability is a normal expectation.

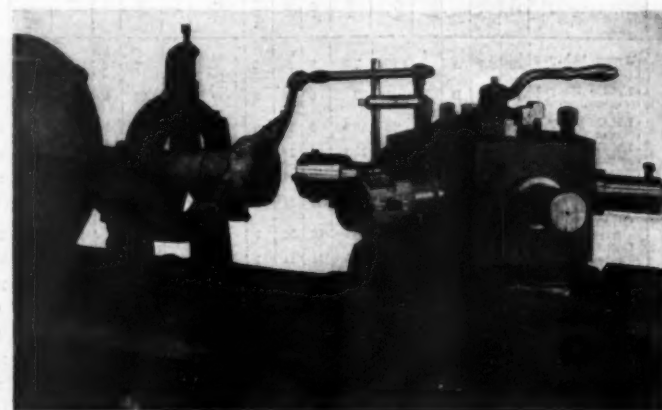


Fig. 6—Turret lathe working on a drop forging of intricate shape, as used in live rear axle work

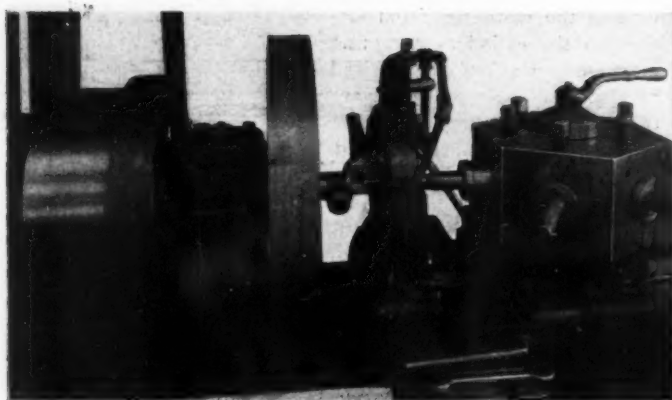


Fig. 7—Turret lathe working on a nickel steel steering pivot held in a steady rest

Fig. 7 represents another important operation being performed on a turret lathe, in which a steering pivot is held on a face plate, centered in a steady rest and bored out by a boring tool. This is an extremely difficult operation, primarily, because the bore is not for a complete circle, then, due to the difficulty in holding the part, and finally in view of the tough and hard character of the nickel steel used.

Check Methods Must be Used.—When the parts are made, they go to the inspection department to be gauged, micrometered and inspected. If they come up to drawings and standards they pass on to the assembling departments. When they are assembled, considering the checking they receive in the testing department, it would seem as if they might then go directly into cars, especially in view of the customary road test every car receives.

Not so. If an adjustment is not rightly made noise will be the normal expectation, and if a bearing is set up too tight heat will soon be induced, even though oiling be profuse. To guard against all such matters the assembled rear axles, motors and transmissions are set up in testing machines, one of which is shown in Fig. 8. As will be observed, the axle is set upon pedestals so that the propeller shaft engages the shaft of an electric motor, from which power is obtained in excess of the power of the regular motor in the finished car. Fan blades are clamped to the live shaft of the axle and the motor is started. The speed of the electric motor may be increased at will, and

may be even considerably higher than the highest possible speed the motor in the car will run at. If the bevel drive makes any noise at all it is examined and adjusted; if the noise cannot be removed the axle is dissembled and the reason ascertained. When the axle is made to run noiselessly at all speeds the test is continued until the bearings are run in. In this way much delay is saved, and the road testers of the finished cars are then able to make the customary 100 miles without having to tinker with the mechanism. A similar machine is used to test transmissions, and after they are adjusted to a noiseless performance they are kept under load until the bearings are run in and to assure that there is nothing wrong.

The idea has been to illustrate the manner in which special devices are made to serve the purpose of building cars, in which

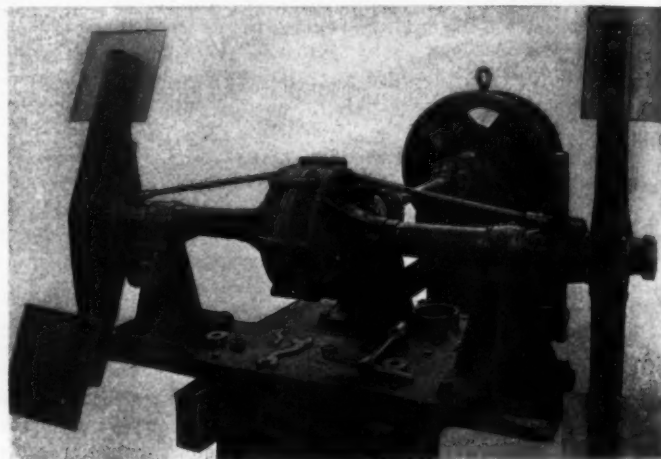


Fig. 8—Testing a live rear axle after it is assembled to see if it will make noise, and to give it a test load

interchangeability is the main criterion, and with the understanding that quality must never be beyond the reach of the class of buyers who are catered to. The machines illustrated are but a few of the many in use in the Pierce plant.

AGRICULTURAL TRIALS AT BRANDON

Following the Winnipeg trials, so closely in fact as to almost form part of them, were the trials at Brandon, the same machines

appearing at the latter place as competed at Winnipeg. As planned, the trials were to include brake, hauling, and plowing tests, but the tests dragged out so long that it was necessary to abandon the hauling test, which was last on the program. The plowing tests showed some very interesting results, the 25-horsepower Rumely steam tractor, for instance, hauling a 14-furrow 14-inch Deere plow a mile in 15 minutes. This was, however, done at the expense of fuel and water consumption, so this machine did not figure in the final results.

There were, aside from the class awards, two championship prizes to the International Harvester Company, for gasoline engines, with the No. 3 20-horsepower machine; to the Avery Company, for steam engines, with No. 12, a 30-horsepower machine.

Tabulated Results of the Trials at Brandon.

Tabulated Results of the Trials at Brandon.																										
No.	Maker.	Brake test (20 points.)					Ploughing test (40 points.)										Price, 10 points.	Turning, 5 points.	Pnts 50 & 90		Total score					
		Rated brake h.p.	brake h.p.	Class.	Pounds water per lb. coal.	Pounds fuel per h.p. hours.	Score for brake test.	No. of ploughs hauled.	Width of furrows.	No. of rounds ploughed.	Time per round.	Total fuel used (lb.).	Total water used (gals.).	Depth ploughed.	Acres ploughed.	Pounds of fuel per acre.						Score for ploughing.	Score quality of ploughing. — Score for water used, 4 points.			
1	Avery, 15 h.p. (gasoline)	36	16	A	—	1.094	7.8	3	in. 14	2	29 3/4	10	6	in. 4	.948	11.79	10	18.5	—	\$ 2,500	2.9	ft. in. 43 6	2.9	75.5	111.5	
2	I.H.Co. 15h.p. (gasoline)	19	21	B	—	.416	19	8	16	3	30 19 18	30	27	4	1.45	13.79	9.54	10	—	1,700	4.7	18 4	4.1	60	106.3	
3	I.H.Co. 20h.p. (gasoline)	28	35.9	B	—	.50	15.8	6	14	2	30 36 35	12	44	4	1.7	0.46	18.2	17.5	—	2,300	4.3	18 0	4.1	61.5	121.4	
4	I.H.Co. 20h.p. (gasoline)	28	36	B	—	.654	12.2	6	14	2	33 32 31	104	27	4	1.7	0.17	19	19	—	2,100	4.7	17.8	4.15	61	118.0	
5	Avery, 30 h.p. (steam)	60	69.9	E	6.94	4.94	15.6	8	14	1	164	119	500	4	1.131	106.2	11.14	2.8	not given	8.5	26 0	2.7	70.3	126.5		
6	I.H.Co. 20h.p. (gasoline)	28	20.7	A	—	.53	15	4	14	2	30 30 30	21	27	4	1.131	18.87	6.83	12.5	—	2,100	3.6	15 9	4.2	58.5	100.1	
7	Case, 32 h.p. (steam)	110	88	D	7.9	4.09	15.6	12	14	1	18	185	881.4	4	1.454	129.3	12.6	16	3.47	4,105	8.2	35 0	3.25	79.7	137.0	
8	G. Scott, 25h.p. (steam)	76	76	D	7.04	4.96	15.2	14	14	1	304	154	681.9	4	1.28	77.7	15	14	4	3,755	7.3	31 0	3.95	75.25	134.7	
9	Case, 30 h.p. (steam)	60	92.9	E	7.21	4.97	17.1	8	14	1	164	181	756.4	4	1.181	116.8	10	16.3	1.84	not given	8.5	29 0	2.9	79.64	137.2	
10	Rumely 30 h.p. (steam)	90	90	D	7.26	3.97	19	14	14	1	304	278	943.0	4	1.98	140.4	8.3	14.5	92	3,663	9	38 0	3.10	71.2	136.0	
11	Avery, 30 h.p. (steam)	60	94	D	5.47	4.94	15.6	12	14	1	29	183	600	4	1.454	125.1	9.28	17.6	3.65	3,750	9	29 0	3.90	79.8	138.3	
12	Rumely 35 h.p. (steam)	75	78.4	D	7.68	4.17	18.1	14	14	1	15	120	1440	4	1.98	97.2	11.9	14	1.65	3,189	9	36 9	3.15	79.2	135.9	
13	Marshall, 50h.p. (gasoline)	60	58	C	—	.86	—	12	14	1	274	28	162	4	1.7	13.08	8.7	14	—	3,500	6	43 0	2.9	71.5	111.2	
14	Rumely, 50 h.p. (steam)	120	99.5	D	7.73	5.165	14.56	14	14	1	304	197	1730	4	1.98	96.5	11.71	15.5	1.45	4,400	8.2	27 0	3.65	79.2	134.2	
In column marked *, 90 points are the basis for marking gasoline engines—90 for steam. Possible points in gasoline engines, 153— In steam, 165.																										

In column marked *, 90 points are the basis for marking gasoline engines—90 for steam.

Possible points in gasoline engines, 153—

IMPROVING CARBURETER FLEXIBILITY

By H.L. Towle

ALMOST any carbureter will give a reasonably good mixture through a limited range of action. Frequently, however, this range is found insufficient for a particular engine. If right for low speeds, it is wrong for high speeds, and vice versa. The owner, therefore, adjusts for the best results at his usual driving speeds, and he keeps within those speeds as much as he can. This limits the use of the machine.

Possibly the carbureter found thus deficient is giving the best results of which it is capable. If, however, it is of good design, there is hope of improving its action considerably by the simple device of providing it with the most suitable spring or springs, and occasionally by modifying the fixed air inlet or the spray orifice as well. The principles governing the action of helical springs are extremely simple, and by a few minutes devoted to their study any auxiliary air valve may be made to give the best results of which it is capable in that particular carbureter. The major portion of the following paragraphs will therefore be devoted to explaining the behavior of the springs.

The theory of carbureter action as regards the behavior of the gasoline jet under different air velocities is still only partially understood, and has been the subject of a great deal of more or less blind theorizing, based in many cases on wholly inadequate data. Into these theories it is not the purpose of the present article to digress, but rather to indicate to the non-technical owner how he can obtain the best results with the means at hand. That is, it partakes of the practical.

Non-Automatic Variety Causes Richness to Increase with Speed—A non-automatic spraying carbureter (i. e., a simple nozzle in an air tube) makes no mixture at all till the velocity of the air stream reaches a certain minimum. Beyond this point, the richness increases with the speed. Dilution from the auxiliary valve is therefore required only when the richness of the mixture exceeds the normal. At this point it should be remembered that, so far as the spray is concerned, there is no difference between a wide open throttle at slow engine speed (e. g., up hill) and reduced throttle with high engine speed. The spraying action is concerned only with the velocity of the air past the nozzle before the throttle is reached.

Almost every carbureter is provided with a needle valve controlling the spray orifice. With this provision it is very easy to determine whether or not the carbureter is doing as well as it should at either low or high speed. For example, suppose that we start with an adjustment known to be satisfactory for medium speeds. If the low speed performance is under suspicion, it is only necessary to increase the needle valve opening slightly to ascertain whether starting is thereby made easier and a walking pace more smoothly maintained. If overheating results, reducing the needle opening will probably cure it. Similarly slight changes in the needle opening, without changing any other adjustment, will determine whether or not the mixture is improved by less

or more gasoline at high speed. The subsequent procedure will depend on whether (when the carbureter is correctly set for medium speeds) the mixture is:

- A. Weak at low and rich at high speeds, or
- B. Rich at low and weak at high speeds.

In the first case more, and in the second case less, air must be admitted at high speeds by the auxiliary valve. What springs will produce these results?

Some Spring Characteristics—It is a characteristic of all springs that their flexure is in direct proportion to the load imposed, up to the elastic limit of the spring. Thus, if the spring represented unloaded at A, Fig. 1, compresses 1-4-inch under a load of 2 ounces, it will compress another 1-4 inch under 2 ounces more, an inch under 8 ounces total load, and so on. This is the first, most important, and most easily remembered law.

It is apparent at a glance that if the spring in Fig. 1 deflects 1 inch under a certain load and has 8 turns, its deflection per turn will be 1-8 inch. If the spring were similar in every other respect, but had four turns instead of eight, that is, half as many, its total deflection for the same load would be only half as great. If it had sixteen turns its deflection would be twice as great, and so on. In other words, the more turns a spring has the less force is required to compress or extend it a certain total amount. The fewer it has, the greater is the force required for a given total deflection, simply because the needed deflection per turn is less or greater as the case may be. For this reason it is customary to reckon spring action in the amount of deflection per turn, and then supply turns enough to obtain the desired total deflection under the desired force. For example, suppose we want a spring similar to A, to deflect 5-16-inch under 4 ounces load. The deflection is 1-8-inch per turn under 8 ounces, or 1-16-inch under 4 ounces; consequently 5 turns will give the total deflection desired, namely, 5 times 1-16.

The second law of spring action is that the deflection per coil is proportional to the cube of the diameter of the coil measured to the center of the wire as in Fig. 2; that is to say, if we double the diameter of the coil using the same wire and same number of turns, the deflection per turn will be eight times as great. If we halve the diameter, the deflection will be one-eighth as great. This merely states the familiar fact that a large spring of a given wire is "soft," and a small spring stiff.

Third Law Deals with Diameter of Wire—The third law is that the deflection per turn is inversely proportional to the fourth diameter of the wire. If we double the diameter of the wire without changing the size of the coil we shall reduce the deflection per turn to one-sixteenth of its former amount.

These relations are expressed in the formula:

$$E = \frac{D^3 \times w}{d^4 \times K}$$

in which E is the deflection, D the diameter of the coil (see Fig. 2), w is the load, d the diameter of the wire, and K a constant depending on the units employed.

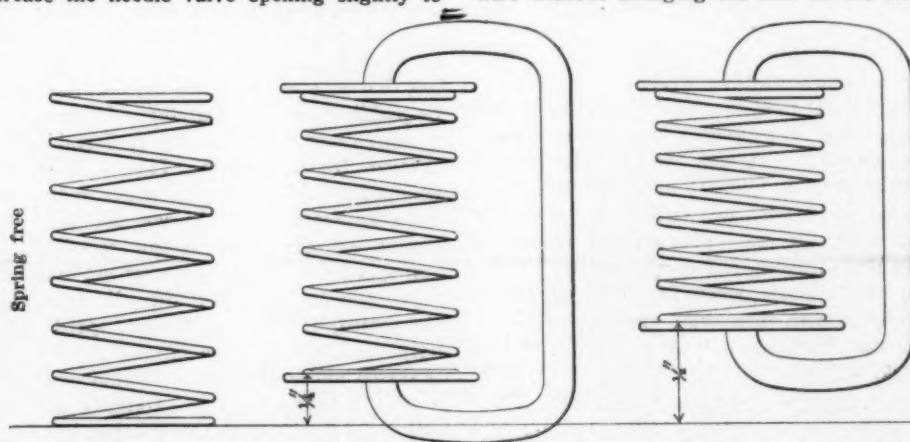


Fig. 1—Carbureter springs shown in three positions, first or A, free, second or B, partly closed, and third or C, compressed one-half inch

Now let us look at the carbureter. Instead of having the auxiliary air valve spring perfectly slack when the engine is at rest, so that the air valve opens on the slightest suction, we compress it so that a certain degree of suction is required to start the valve from its seat. Since the gas velocity is proportional to the suction, the valve will then open by equal amounts for equal increments of suction.

How is all this to be applied to the particular spring of the reader's own carbureter? Let us see. Suppose your carbureter is in the condition of *A*, noted above. You need a richer mixture for starting and a leaner mixture at high speeds. First examine your auxiliary valve to see whether there is room for wider opening, provided the adjustment of the stop is changed. If not, there is small hope that you can do much to improve it, though there is still a chance that you can help matters by en-

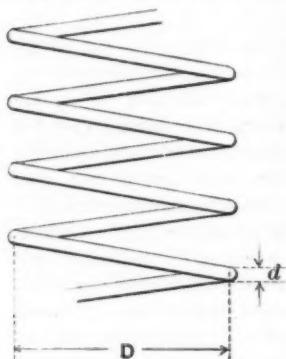


Fig. 2—Small coil spring with dimensions

larging both the primary air intake and the spraying orifice. It may be that you have a heater connection on the carbureter intake and that it strangles the air more than it should. Enlarge the heater, or disconnect it if the weather is not too cold. Then try running the car again. If the former intake was too small you will find that you can increase the needle opening somewhat on account of the reduced suction. This will give you both more air and more gasoline, and will help the performance at high speeds without impairing it at low speeds.

Put the auxiliary air valve spring under tension so that it will not open till the motor gets up to speed, but be sure that it opens as much as needed at high speeds.

To Improve Running at Low Speeds—Suppose, on the contrary, that your first examination shows a margin still available for further opening of the auxiliary air valve. To improve the running at low speeds, open the needle valve as much as required, and if necessary constrict slightly the primary air intake (if there is provision to do so). This will give a stronger suction or a freer flow of gasoline on starting. You may or may not find that simply slackening the air valve spring will give good results all the way from medium to high speeds. It may have the effect of letting the valve open too soon, giving a weak mixture at low speed. This indicates that the spring has too few turns, since when adjusted correctly for low speed its tension increases too rapidly with increased opening of the valve. Get a second spring with several more turns, winding it, if necessary, from brass wire or piano wire of the same thickness. Leave it with too many turns at first and shorten it one or two turns at a time. Stretching a spring is no substitute for added turns.

It may be that the spring, instead of being too short, was originally too long, and that over-richness at high speed has resulted, not from excessive spring tension, but from the necessity of substituting the stop for the spring, owing to the latter being too weak to hold the valve at high speed. Such a spring may permit the valve to open too early, causing weakness of the mixture at low speeds. Supposing that opening the needle valve has shown improved action at low speeds, restore the needle valve to its first setting and try tightening the air valve spring and slacken up on the stop. This is likely to improve matters up to a certain point. If, however, the valve still strikes the stop too early in the speed scale, cut one or two turns from the spring, stretch it or run the adjusting nut down, and try again. With the same tension on the valve when first opening, there will be an increased tension with maximum opening, and this increase may steady the valve sufficiently to permit the stop being run still further back.

Treatment of Too-Rich Mixture at Low Speeds—Now let us turn to the converse supposition "*B*," i.e., that the mixture is too rich at low speeds. This is invariably due to faulty selec-

tion of the auxiliary valve spring. The spring has too many coils, making it "soft," and to obtain sufficient tension to control the air valve at high speeds the spring is given an initial tension which carries beyond where it ought to be. It must be borne in mind that the permitted range of movement of the spring from shut to open of the air valve is very small. To correct the difficulty, simply cut off some of the turns, reducing the movement necessary to obtain the maximum tension.

The foregoing applies to all types of carbureters having spring controlled auxiliary air valves. In a few carbureters two such springs are used—a weak spring for low speeds and a stiffer spring for high speeds. The purpose of this is to correct an inherent tendency of the auxiliary valve to admit too little air at low speeds, and too much at high speeds. Its value will depend on the design of the particular carbureter. In some, all the air instead of a portion comes through the automatic air valve.

In case the spray orifice is not controlled by a needle valve, as in some carbureters having a fixed nozzle, the line of investigation must be altered somewhat. Unless these have a variable primary intake, all the adjusting must be carried out on the auxiliary air valve. If the primary intake is fixed, first adjust the auxiliary valve spring to give good results at medium speeds. Mark the spring adjustment and increase the tension to determine whether a richer mixture gives better results at low speed. If it does not, slacken the tension, confining yourself exclusively to low speeds during the test. Make a note of the setting which gives the best results, and try again in similar fashion for high speeds. You are now in a position to classify your case under *A* or *B* above, and to modify the spring setting intelligently.

Reducing Fixed Air Intake Reduces Suction—If the fixed air intake is variable, the rule to remember in adjusting it is that reducing this intake increases the suction in the mixing chamber, and thereby increases the richness at low speeds.

Of course, not all carbureters are equally good. A carbureter may be so proportioned that it is incapable of working well at low speeds when adjusted for ordinary speeds; less frequently it may show an incurable propensity for delivering an over rich mixture at high speeds. The former defect may be due simply to the carbureter being too large for the engine, which means that the air velocity through it is not sufficient at low speeds to atomize the gasoline properly; or it may arise from original bad design. For example, the "strangling passage" around the spray nozzle may be too large in proportion to the size of the auxiliary valve, or there may be no constriction whatever around the nozzle, as in certain types now obsolete. The latter defect—i.e., persistent over richness at high speed—generally indicates that the carbureter is too small for the engine, but it may arise from limitations of design, as a larger carbureter of the same model may not work well at low speed. In this latter case, the cause of the trouble lies probably in the auxiliary valve being too small even when adjusted for its maximum opening. The only thing to be done here is to insert a supplementary inlet valve in the intake piping between the carbureter and the engine.

Certain carbureters of what is known as the "puddle type" have no auxiliary air valves, but derive their automatic action purely from changes in the size of the puddle and from that fact that at low speeds suction is assisted by gravity in keeping the puddle filled. Carbureters of this type are very satisfactory in many cases, but they may be found to have a range not quite sufficient for the engine. This is easily determined by varying the needle valve setting as above indicated. It does not do to use a carbureter of this type too large for the engine; since then it will not work at low speeds. On the other hand, at high speeds the engine may not get sufficient mixture, and what it gets may be too rich if the adjustment is right for low speed. The remedy is to adjust for low speed and provide a small auxiliary valve between the mixing chamber and the throttle, with its spring under considerable initial tension, so that it opens only at high speeds. A large auxiliary air valve is unmanageable here because the slightest opening lets in considerable air, but with a small valve excellent results have been obtained.

KNOCKS AND NOISES THAT PERPLEX AMATEURS

By EDWARD S. KEOGH

ELUSIVE knocks and noises are the nightmare of the careful motorist and cause an otherwise pleasant journey to be an anxious, nerve-racking trip. It is a remarkable fact that every unusual knock or scrape is at once attributed to a defect in the engine; no doubt because the engine is the source of power and more in the mind of the driver than is any other part of the mechanism. Engine knocks also are to be feared, as a rule, more than knocks from other sources, as they tend to indicate loose bearings in shaft or piston, or loose cylinder bolts, anyone of which might result in serious injury to the motor.

But there are many noises which sometimes jar the ear of the driver and cause him to be anxious about his engine. These occur from other than engine defects, although from the rhythm of their occurrence one is positive that the engine is at fault. This, no doubt, is caused by the vibration of the engine jarring the loosened part and making the knock heard in accordance with its own vibrations.

Loose Oil Pipe Puzzled for a Long Time—The writer's car developed a knock at one time which seemed to come from the engine, but the cause was a loose oil pipe which ran from the dash, underneath the foot boards, to the transmission. This loose pipe rapped sharply on the bottom of the boards whenever the engine was speeded, giving all the symptoms of a very loose bearing until an examination revealed the actual condition. In another case a two-cylinder shaft-drive car developed a disheartening knock when on a long trip, which was laid to the connecting rods and the first garage met with was consulted for advice. The rods were examined by the garage man, who advised that they be tightened, which was done, although the driver hardly thought it was necessary. Soon after the trip was resumed, the knock again appeared, but the journey was continued to a certain garage where there was a mechanic in whom the driver had considerable faith as a troublefinder. This mechanic examined the connecting rods and said they were too tight and should be loosened and that the engine was all right. When the bearings were set to his satisfaction he proposed a short ride that he might hear the noise himself. The car was started and had not gone two hundred feet when he told the driver to stop

and, getting down took up the foot boards and made an examination. It was found that the springs which held the forward end of one of the distance rods had broken and the rod was free to pound with the vibrations of the engine. An old exhaust valve spring was inserted and it has held better than the ones furnished by the maker.

Source of Trouble Usually Hard to Find—The same car developed an aggravating knock at one time which was extremely hard to find and which would show only when the engine was running free and on changing speed. It was found after many weeks that the crankshaft had too much end play and that the knock was caused by the flywheel hammering against the rear bearing. When the clutch was in, the flywheel was kept tight against the bearing and there was no knocking. This was more serious than at first appears, because the wear in the bearing caused the shaft to move forward, displacing the connecting rods from their proper line and causing undue strains on them and their bearings. In the same car an unusual noise or scraping occurred at the end of last season when the cold weather was approaching and made itself apparent usually at the beginning of a trip and disappeared gradually as the car warmed up. The cause of this was found to be that the cold weather had congealed the oil and grease in the gear case and that the gears cleared a path for themselves in the hard grease and then ran practically without lubrication until the heat generated softened the grease to a more fluid state.

The addition of some light oil cured the noise but did not improve the appearance of the garage floor under the car when it came in from a good run.

Now no noise or knock should be neglected, but the writer has found from experience that if you drive your car up a good stiff hill on high gear until the engine shows signs of laboring and no knock appears continuously with the explosions of the engine, you can be sure that your engine bearings and holding down bolts are tight and sound.

And if a slight knock does appear on such a severe test of the engine, there is no immediate necessity of the bearings being examined and tightened.

MOLECULAR WEIGHT OF DISTILLATES

The atomic weight of the elements entering into the fractions may be set down thus:

Hydrogen	1
Carbon	12
Oxygen	16

The molecular weight may be found as follows:

- (a) butane, $C_4H_{10} = 4 \times 12 + 10 \times 1 = 58$;
- (b) pentane, $C_5H_{12} = 5 \times 12 + 12 \times 1 = 72$;
- (c) hexane, $C_6H_{14} = 6 \times 12 + 14 \times 1 = 86$;
- (d) heptane, $C_7H_{16} = 7 \times 12 + 16 \times 1 = 100$;
- (e) octane, $C_8H_{18} = 8 \times 12 + 18 \times 1 = 114$;
- (f) nonane, $C_9H_{20} = 9 \times 12 + 20 \times 1 = 128$;
- (g) decane, $C_{10}H_{22} = 10 \times 12 + 22 \times 1 = 142$.

In like manner the molecular weight of any of the compounds may be found, the rule for which may be stated as follows:

Multiply the atomic weight of each element by the number of atoms for each element and the sum of the respective products will be the molecular weight of the resultant compound.

In general practice it has been the custom to consider that gasoline was largely hexane, the molecular weight of which was taken in the further determinations. It is highly improbable that this method will serve, on the count that hexane is not now used to the same extent as formerly and the chances are that heptane and octane will have to be taken into account.

SPECIFIC HEAT OF HYDROCARBONS

In order to be able to estimate the losses in the exhaust of a motor it is necessary to know the specific heat of the elements and compounds determined by analysis of the exhaust, together with the range of temperatures, as well as the weight of the exhaust gases. The specific heat values are as follows:

ELEMENTS AND COMPOUNDS	SPECIFIC HEAT
Carbon	0.241
Carbon monoxide	0.2479
Oxygen	0.218
Hydrogen	0.244
Nitrogen	(approximately) 0.240

Since over 80 per cent. of the whole weight of gas (mixture) will be nitrogen, it follows that much of the heat lost to the exhaust is taken away in the nitrogen. This fact, coupled with the absence of heat value in nitrogen, tends to the contention that nitrogen is an evil without a recompense. In the absence of nitrogen the fuel would be so quick-burning that the pistons would not be capable of receding rapidly enough to enable the functions to be performed, and it follows that some element has to be present the nature of which will serve to dampen the rate of flame propagation. Nitrogen is at hand in the right proportion and the cost of its provision is therefore nil, since, as exemplified above, it has no heat value.

PECULIAR POUNDING

Editor THE AUTOMOBILE:

[2,037]—I have a four-cylinder E-M-F "30" that has gone over four thousand miles without a particle of trouble that could be called trouble. I have nothing but praise for the car in regard to its keep-a-going and power qualities, but it has developed a knock that is very irritating and is something that I have been unable to fathom out. It seems to be something about the mixture as near as I can tell.

I will tell you what I have done and how the knock occurs: In starting up and getting under way everything runs smoothly and the motor seems to pull well, but when the car gets on a level road the knock commences. The knock synchronizes with the explosion in one of the four cylinders. Sometimes instead of knock there will be a pound, the sensation of which is one that you would imagine from a sudden and violent explosion in one of the cylinders. When there is a hill to climb, the car works like a charm, no knock or indications that she wants to knock, or in going down the hills when I use the motor to hold the car back. In brief, the knock only occurs on a level road or nearly level road, when the car gets up to the speed corresponding to the throttle opening. By first opening and then shutting the throttle down a little I can run the car without the knock. By putting more tension on the auxiliary air spring I can get more speed up before the knock begins, but if I continue to take up the tension, it consumes too much gasoline and soots everything up. I have had the cylinders off and cleaned all the carbon out of both cylinders and pistons. I examined all the bearings and can find nothing but moving fits, no looseness anywhere. If you can tell me where the trouble is and can suggest something to do to get this knock out I shall renew my subscription to "The Automobile" at once.

F. W. KAER.

Lawrenceville, N. J.

There are a number of things which might, and, in fact, do cause pounding, but none of them seem to fit your case. The most obvious cause of pounding is that of a spark advanced too far. This, however, nearly always occurs upon hills, in deep sand or mud, or elsewhere, whenever the engine is laboring very hard. It could not be so in your case, as you distinctly state that manipulation of the throttle will cause it to stop and that it occurs only on smooth, level roads at rather slow speeds. In the case of too far advanced spark, manipulation of the spark would only make the pound worse than ever. So, too, if the spark was normally set too far advanced, it would pound more at high speeds than at slow, just the reverse of the actual case.

Preignition causes pounding, and is itself caused by overheated cylinder, piston or cylinder walls. Glowing points or deposits of carbon within the cylinder, as well as faulty or uncertain ignition also cause it. Leaks in the chamber are sometimes the cause of pounding, so too, are looseness of parts. Among the latter may be cited: connecting rod bearings, main bearings, loose flywheel, cracked flywheel, other lost motion. Beyond these things, the only other cause of pounding is that of some moving part which strikes as it rotates.

By listing these in a regular order and going through them one at a time, you will be able to run down the cause of the trouble, or incidental to your search, some contributory cause. Many of them may be eliminated at once, without wasting the time for a search, which will lighten your work. This is a kind of trouble of which we have never heard previous to this, and



LETTERS INTERESTING

it doubtless is a combination of several things, some of which were not apparent in the searches which you made.

DIFFERENT KINDS OF PAINT

Editor THE AUTOMOBILE:

[2,038]—I have noticed in "The Automobile," issue of September 2, page 399, under the heading of "Information for the Man Who Drives," that you recommend for the brass and nickel parts of a car, a coat of man of war gray or oxidized bronze finish. What is this and where can it be obtained?

I. S. BOLES.

Shellsburg, Iowa.

Both of the finishes mentioned are but trade names for colors used in finishing cars, that is, they are nothing but paints. In buying a new car, these colors may be had for the asking, without extra charge, but it will be necessary to wait longer for the delivery of the car. If you have a car and wish to apply the color to it, buy it from any reputable paint maker, and it is applied the same as any other paint or color. If there is anything special about its application, the makers will advise you of that fact when the stuff is purchased. The use of paint like this is a very good thing, saving as it does many a long hour's work polishing up the readily-tarnished brass and nicked parts.

BALL BEARING APPLICATION

Editor THE AUTOMOBILE:

[2,039]—Referring to Fig. 19 in the article on "Automobile Wheels and Rims" in your issue of Sept. 16, '09, we would like to ask, has this application of annular ball bearings been adopted with any degree of success, if so in what make of car? We believe such construction would be very near ideal with regard to friction and ease of application. If the bearing would stand up under the strains placed upon it due to peculiarity of this arrangement.

PETERSON BROTHERS.

Denver, Colo.

It is the impression that the arrangement spoken of is ideal, just as you have said, in that it does not represent an actual rear axle construction now in use. As a matter of fact, there are a number of firms now using the single row of balls, for the rear wheels, as well as a single ball for the front wheel knuckle bearing. From our present knowledge of ball bearings, we see no reason why this construction would not stand up, providing the bearing makers were consulted in the selection of the bearings.

You will note on looking at this figure again that it was used not for this purpose but to bring out another point, namely, the combination of the brake drum and inner flange, as well as the method of locking the bolts so that the nuts may be screwed up tighter or loosened at will, and that without dissembling the whole outfit.

WHOLE RANGE OF SUBJECTS

Editor THE AUTOMOBILE:

[2,040]—Will you please answer the following questions through your department, "Letters Interesting, Answered and Discussed"?

1. How shall I restore the coloring or recolor the inside of my pantasote top? The lining appears to be cloth. It was a purple but has faded. I want it black or very dark.
2. What is the best dressing for leather straps, etc., to keep them soft, pliable, and black?
3. Does properly proportioned alcohol and water have any injurious effect on the water system of a car? And is the cooling effect ample, as no doubt the alcohol boils at a lower temperature than water?

W. T. A.

St. Paul, Minn.

If the material of the inside of the top were cloth, as you say it appears to be, any ordinary dye would answer. In default of certain information relative to this, it would be advisable to communicate with the manufacturers, the Pantasote Co.

2. Without saying what is the best dressing, plain neatsfoot oil will keep the leather, or anything made of leather, soft and pliable, if used freely. This may be obtained at any leather store. As for the color, it will have no effect on that, that is, if the color was black before using, it will remain black after use.

3. See another letter on this same subject elsewhere in this issue. A properly proportioned mixture is any old proportion, that is, there is no proper proportion. The only injurious effect is that the rubber hose at the joints is affected, but this is a very slow action and one that becomes lessened with the age of the mixture since the alcohol boils away gradually, leaving the mixture with a lessened proportion of alcohol, which constitutes the destructive part of the mixture. As the diagram of cooling effect shown in the other letter referred to above shows, a temperature of minus 30 may be obtained very easily. This mixture has to be watched very closely on account of the mixture boiling away as brought out above. The boiling point of alcohol at atmospheric pressure is 173 degrees Fahr., that of water at the same point being 212 deg. The mixture would have a boiling point somewhere between the two depending upon the proportions of each used.

To overcome this defect of the alcohol solution, many autoists use the alcohol-glycerine solution, with which the loss by boiling is reduced to a minimum. This is used by making first a solution of half and half alcohol and glycerine. The latter is then used just as any other liquid to make the final fluid. Glycerine itself lowers the boiling point very little, but the lessened quantity of the alcohol makes the boiling point for the whole solution much higher.

ANSWERED AND DISCUSSED



SHIPPING CAR TO 'FRISCO

Editor THE AUTOMOBILE:

[2,041]—Will you please give me some idea of the best way to ship a car from the East coast to the Far West coast, that is, from New York City to San Francisco? Is the all-rail route quicker or cheaper than the all-water route, or is the combined rail and water route the best? Is it better to ship in a special automobile car, or to crate and ship on a flat car? Will you also give me some idea of the time taken by a car to travel over this route, that is the shortest time upon which I may figure.

J. A. D. BYERS.

New York City.

While we cannot give you the best route, we can tell you something about the various routes and the conditions attaching to the shipment of a car over them, from which you may make your own deductions as to the best, or at least, the most advantageous. There are three routes by which you may ship: the all rail; the all water, and the combination route, part water and part rail.

The all-rail route presents the least number of difficulties, that is, you will only have to run your car into the New York freight depot and ship it, all other details being attended to by the railroad officials. By the all-water route, which is the longest, but to offset that, the cheapest per hundred pounds, it will be necessary to have the automobile crated, and then, the crate transported to the boat line dock. Then, you will have to have it uncrated at the western end after its arrival. By the rail-and-water combination route the same points offer, that is, it will be necessary to crate the automobile and parts.

For the all-rail route it is not necessary to crate, as the railroad company will furnish an end door or other special automobile car, and the railroad officials will block and otherwise fasten the machine in the car. In fact, shipping in this way, it would be foolish to crate as this only adds to the total weight, which is what you pay for. That is, crating only adds materially to your freight bill.

If you should crate and ship that way, it will be necessary to find out first of all, what total height the railroad will accept. Some of the roads have tunnels and low bridges, which limit the height of the crates which may be carried. Similarly, with the steamboat companies, most of them have a fixed maximum distance between decks, or in the hold, which would limit the height and probably the width of the crate.

As eighteen days is the ordinary time for the trip across by rail or rail and water, it is fairly safe to figure on the machine being there within three weeks. In figuring out the cheapest way to ship, it will be necessary to get an unbiased estimate of

the weight of the crate, since you have to pay for this. The difference between the all-rail and the rail-and-water route is but \$1.00 per hundred. If your crate weight times the lower rate was more than the saving per this route, the total to you would show a loss.

It is just barely possible that you may obtain from one of the numerous forwarding companies a more advantageous rate than the railroads offer. These companies ship many cars and place them so as to occupy less space than they would if placed by the railroad officials. In this way they are able to offer lesser rates. In a case of this sort, it is advisable to attend to, or at least inspect, the shipping of the car yourself to prevent careless fastening of the wheels in place. This might result in the car breaking loose in transit, with much consequent damage to it. The best way to handle the lamps and other small parts is to take them off and box securely.

OVERHEATING CYLINDER

Editor THE AUTOMOBILE:

[2,042]—I have a four-cylinder, four-cycle, forty horsepower car which has lately lost much power on hills. The car runs fine on the level, and even climbing grades. But after the throttle is opened about one-third of the way, the engine will knock, regardless of where the spark lever is placed. I have scraped the motor free from carbon, ground in the valves, and adjusted the carburetor in many different ways. Ignition (by magneto) is perfect as far as I can see. What is the trouble?

Red Hook, N. Y.

R. W. T.

Your pounding trouble may be due to overheating of the cylinders or piston, which, in turn, may result from poor design or from lack of ability in the water cooling system. If the interior of the cylinder overheats from any cause, pounding will result. The water is not always at fault, nor is this, as is thought by some, due to carbon deposits alone. A projecting fin, edge or knob of metal in the cylinder or on the piston will give as much knocking and be a great deal harder to find than the carbon. In fact, the latter is not hard to remove, while the former is.

Another little known cause of knocking, such as you describe, is a loss of compression through leaks. These latter may lie in the valve seats (not in your case though), in the valve caps, in the spark plugs openings and elsewhere. In looking up this trouble, investigate every opening into the cylinder. A similar though unsuspected source of trouble was described in a recent issue, under the caption, "Ingenuity in the Making of Repairs." You will find this on pages 353, 354 and 355 of the August 26 issue of THE AUTOMOBILE.

TO MAKE RUBBER CEMENT

Editor THE AUTOMOBILE:

[2,043]—Will you please tell me how to make a good rubber cement to use when vulcanizing tires?
A. L. C.
Webb City, Mo.

Rubber cement should always be similar to the mixed sheet of rubber upon which it is to be used. That is, it should contain the same percentage of sulphur. If care is not taken with this, strange and unexplainable results are attained in the vulcanizing process. Of course, you will not always be able to find out the proper amount of sulphur used in any one tire, but if the cement as made and used does not give good results, try adding more sulphur. If this should make matters worse, make some of the original cement over, using less sulphur. By keeping track of the various tires vulcanized, the composition of the cement used, and the results obtained, you will soon become very skillful in mixing and applying the proper composition.

Marine glue, so-called, is an excellent cement. This consists of one pound of caoutchouc to one gallon of coal tar naphtha and twenty pounds of shellac. Heat gently and pour on metal plates to solidify. When needed, melt. By using more naphtha, this is made thinner so as to stay liquid. The sulphur in this is in the caoutchouc, but if found insufficient in any one case, more sulphur may be added to the cement in the powdered form, when making it up, or if necessary, when remelting.

Another excellent cement is gutta-percha cement. The composition of this is two parts of gutta-percha to one part of common pitch. It is melted together, and well stirred in the melting, the stirring being fully as important as the materials. When thoroughly melted and stirred, it is poured into cold water. This makes it into a hard brittle substance, which softens at a low temperature, and at 100 degrees is a thin fluid. Like the former recipe, this carries its own sulphur in the gutta-percha, but if more is necessary, it can be added as a powder. In this case, it is not advisable to add the sulphur during the remelting process, but it should be put in while making up a batch of the cement.

As a rule, as little cement should be used as is possible to make a good job. Moreover, all cement should be given plenty of time to dry. Rubber surfaces to be united should be thoroughly cleaned, either with naphtha or with a thin cement. When the latter is used, it is brushed over the surface very lightly, using a fine brush, and then the surfaces are heated gently. This helps the whole operation, because it both softens the rubber and evaporates the solvent, which is then unnecessary to complete the operation, having served its usefulness.

In addition to the various substances mentioned before for cements, it is very often necessary to have the cement dry very rapidly. In these cases, specific driers are added, and may usually be added to

any cement at will, the quantity added being measured only by the required speed in drying. Then there are cases where certain degrees of tenacity are required. For these, other gums are added as rosin, mastic, gumlac, etc. These, however, should be used only when needed, and much discretion should be used in adding them to an already very satisfactory cement.

MILE-A-MINUTE FOR HIM

Editor THE AUTOMOBILE:

[2,044]—Will you please answer the following questions through "Letters Interesting, Answered and Discussed"?

1. Had I ought to have a complete knowledge of an automobile to become a racing driver?

2. Do automobile companies give inexperienced men a trial?

L. M. S.

Denison, Kansas.

Considering the unusual number of race meets which have been held during the present year, and the equally unusual number of fatalities attending the same, at least an average of one man killed per meet, it is surprising that anyone would have the temerity to want to take up racing as an occupation. However, to answer the above questions:

1. Yes, for this purpose you cannot have too complete and thorough a knowledge of not only the machine you expect to drive, but all others as well, and a very clear insight into the principles governing the action of all of the various parts. Not only should you be able to simply drive the car, but you should be able to assemble, disassemble, repair, machine, or do any other kind of work necessary to make any one of the pieces entering into the complete car, and to put it into place, or take it out under any and all conditions. That is, you should be an expert on engines, transmissions, clutches, and other components, as well as on driving. As far as simple driving is concerned, a man of ordinary intelligence can learn to drive in the course of a single day, granting only a car to drive, and someone to show him how. Beyond that comes the superlative skill to permit a man to get more speed out of any given car than any one else can. More even than personal skill, a cool head and steady nerves are required. Without the requisite nerve and coolness, necessary to drive, say at the rate of a mile a minute carrying your gasoline tank in your lap, any amount of skill in handling a machine is of no possible use. More than this, accurate judgment is required since the tight places in which a racing driver is sometimes placed require not leisurely consideration, but instant and immediate decision as to what is best to do, and equally fast work in doing it. An ideal way to prepare yourself for this work would be to go into some automobile factory and work at least six months in each and every department there, closing with about a year of outside testing work. In that length of time (it would doubtless run into three or four years), you would

have proved that you possessed the requisite skill, judgment, nerve, and cool head. At that time you would find little trouble in obtaining a situation as a racing driver, since the supply is always less than the demand.

2. Nearly every firm finds it necessary to hire inexperienced men, who are not hired for the purpose of making racing drivers of them, but to learn the machinist's trade. The way for you to start in will be as an apprentice, then when you have had a little automobile shop experience, change to a position in which you would learn, for instance, to assemble engines, later one in which you would test them, etc. If money is no object, you may obtain a position in nearly any automobile factory in the country.

PROPER ALCOHOL SOLUTION

Editor THE AUTOMOBILE:

[2,045]—Will you please answer the following through "Letters?" What proportion of denatured alcohol and water is proper for an anti-freezing solution? Is there anything in this same line which you consider better than alcohol, and if so, what is it?

TRUMAN B. PEIRCE.

Providence, R. I.

As a matter of fact there is no proper proportion, as any one of a number of proportions will give satisfactory results. There is this to be said, however, that the weakest solution which will stand the climate in which you are located will give the most satisfactory results. The reason for this is that the alcohol evaporates out from the solution, and the stronger the solution, the more there is to evaporate, the easier it evaporates, and the greater the influence of this evaporation upon the solution left.

Accompanying this is given a diagram of the freezing points of various solutions of

denatured alcohol in water. From this diagram select the lowest temperature which you are sure to meet and that will give you the strength of mixture to use. In making this selection, remember the advice given above. Since zero is seldom met with, you might try a 38 per cent solution which will not freeze until that temperature, 0 deg., is exceeded.

Unless you are particularly desirous of using denatured alcohol, you will note from the diagram that wood alcohol gives a much lower temperature, the percentage mentioned above yielding about minus 22 degrees with wood alcohol. No particular one of these solutions is recommended and all of them have their drawbacks. So, the best way to do is to try one and if this does not suit you for any reason, try another. In this connection, see the letter of W. T. A. [2,040] elsewhere in this issue, as well as J. A. Rene [2,029] in the Sept. 30 issue, and that of E. W. J. in the Sept. 16 issue. Both of the two latter have tried various cooling solutions, and this winter are about to try the use of a light oil.

Do not think that because nothing has been said about other cooling fluids than the two kinds of alcohol and oil, that none of the others is as good. This is not the case; these were dwelt upon because you asked about the one, and the other was the subject of the most recent letter on this same subject. Calcium chloride, the curve of which was presented very recently, is very satisfactory to some, as is just plain salt to others. This latter, however, yields but zero degrees, so is not available where temperatures lower than that are common. Then the salts, which are not so well known as potassium carbonate, alone and in combination, are much used.

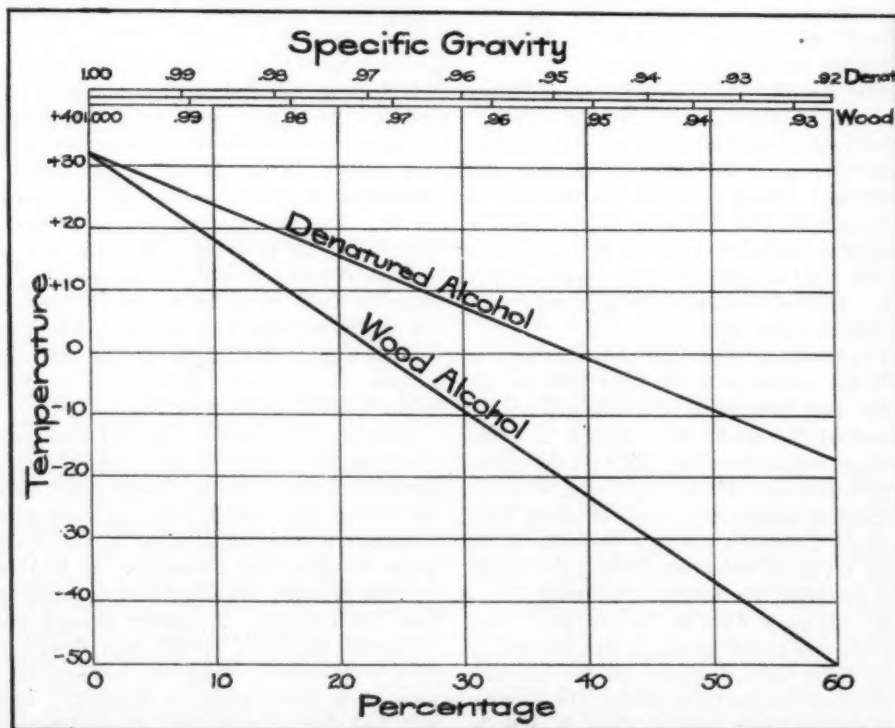
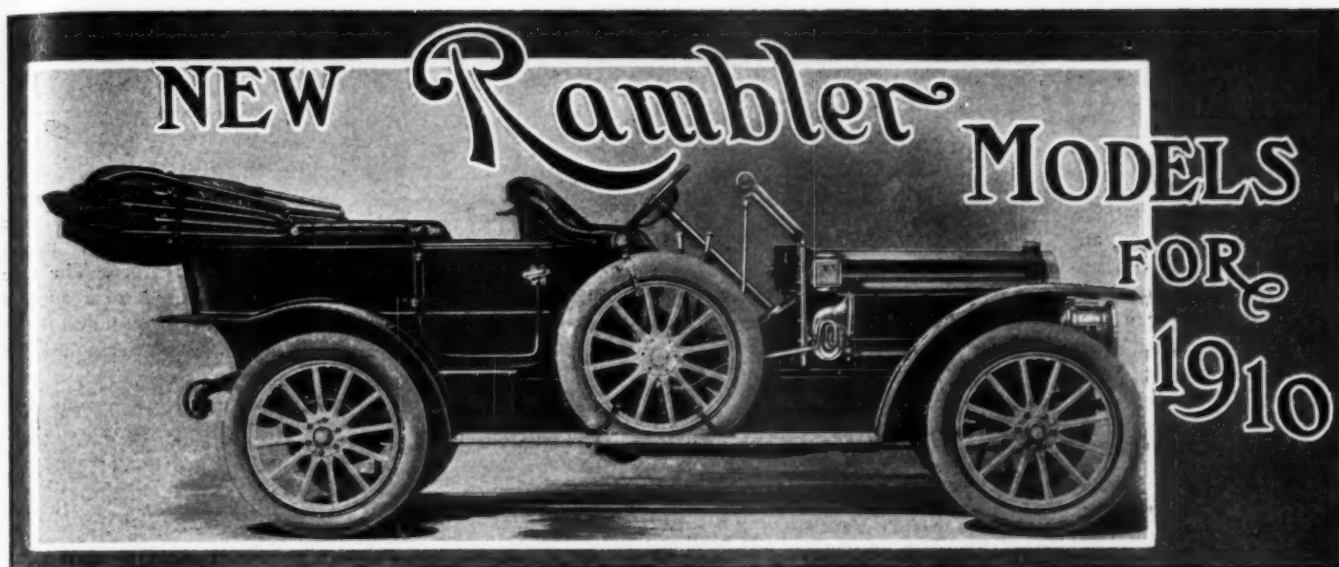


Diagram Showing Freezing Temperature of Alcohol Solutions



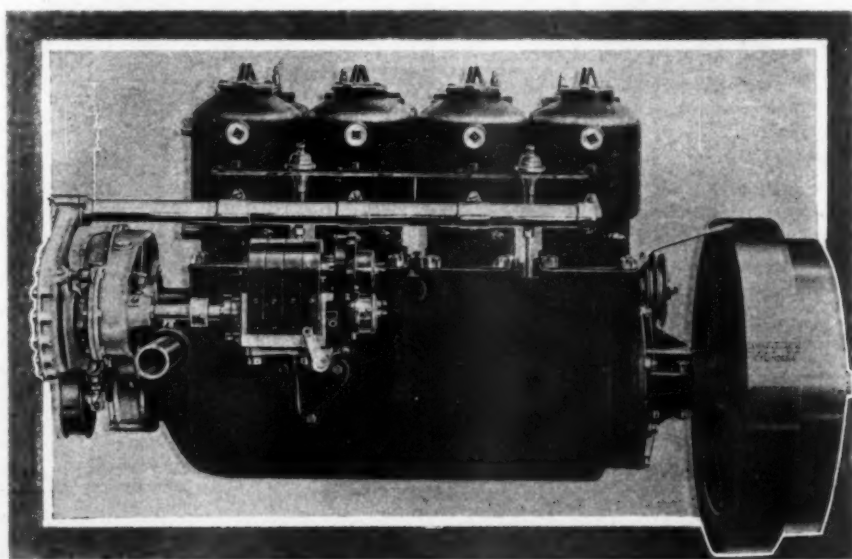
Model "Fifty-five" Is the Name of the Newest Addition to the Rambler Family

WITH the record of another year's successful culmination, and the satisfaction accruing thereto, many a manufacturer is now laying aside the season of 1909 and beginning to attack the problems of another year, that of 1910. This is particularly the case with Thomas B. Jeffery & Company, the features peculiar to whose Rambler car have attracted many. Among these may be mentioned the offset crankshaft, large diameter wheels, straight line drive, spare wheel, and engine accessibility. All of these features will be retained with such amplifications as another year of hard use has dictated. The accessibility idea, in particular, will be carried further, all adjustments having been made more get-at-able than before. This is an improvement which savors of common sense, since an inaccessible adjustment is about as valuable as no adjustment at all. All told there will be five models, but the number of chassis is limited to three, while the engines to be built total but two, and the transmissions, the same.

What the Engines Show—All of the engines are of the four-cylinder type. The cylinder castings are individual, with the valves located on the right, a la Renault. This construction makes the cylinder very simple, and correspondingly safer to use. The crankshaft is offset to the amount of one-fourth of the stroke in each case. This would be 1 3/8 inch for the larger or 5 by 5 1/2 inch motor and 1 1/8 for the 4 1/2 by 4 1/2 inch engine. When first brought out, this was a feature of doubtful utility and one that met with much skepticism. This fact makes its present universal acceptance of more than ordinary value. In fact, the question for argument to-day is not of the advisability of offsetting, which is granted, but, rather, the most advantageous offset. The Rambler manufacturers selected one-fourth as the proper proportion of the stroke after much expensive experimentation. After several years' use, no reason

for changing it has yet appeared. The cylinders are of a close-grained gray iron, while the crankcase is also of cast iron. This latter is now in line with the most modern practice, which is taking account of the unreliability of lighter metals under severe stresses. The case is of the barrel type, that is, it is cast in one piece, with open ends. The crankshaft is put in through the ends, which are then closed by means of circular plates. These latter carry the end bearings also. Speaking of bearings, the individual cylinder construction allows of the use of a bearing on each side of each cylinder or five total for a four-cylinder engine. The many and various advantages of numerous bearings need not be repeated—they are too well known. The shortest, simplest and easiest way to explain it is to say that the result is longer life for the crankshaft and better service during its life.

The barrel crankcase would result in the bearings being very difficult to adjust were it not for the fact that a special design of adjustment is used, and for the additional fact that the valve side of the case is made with a very large hand-hole plate. This measures 8 inches in width by 23 inches long, so that with it removed the whole interior of the case is as open and accessible as if there was no such thing as a one-piece case. Main bearings, connecting rod bearings, camshaft bearings and all parts may be inspected readily, and work done upon them as easily as if they were entirely open and exposed. The wedge method of ad-

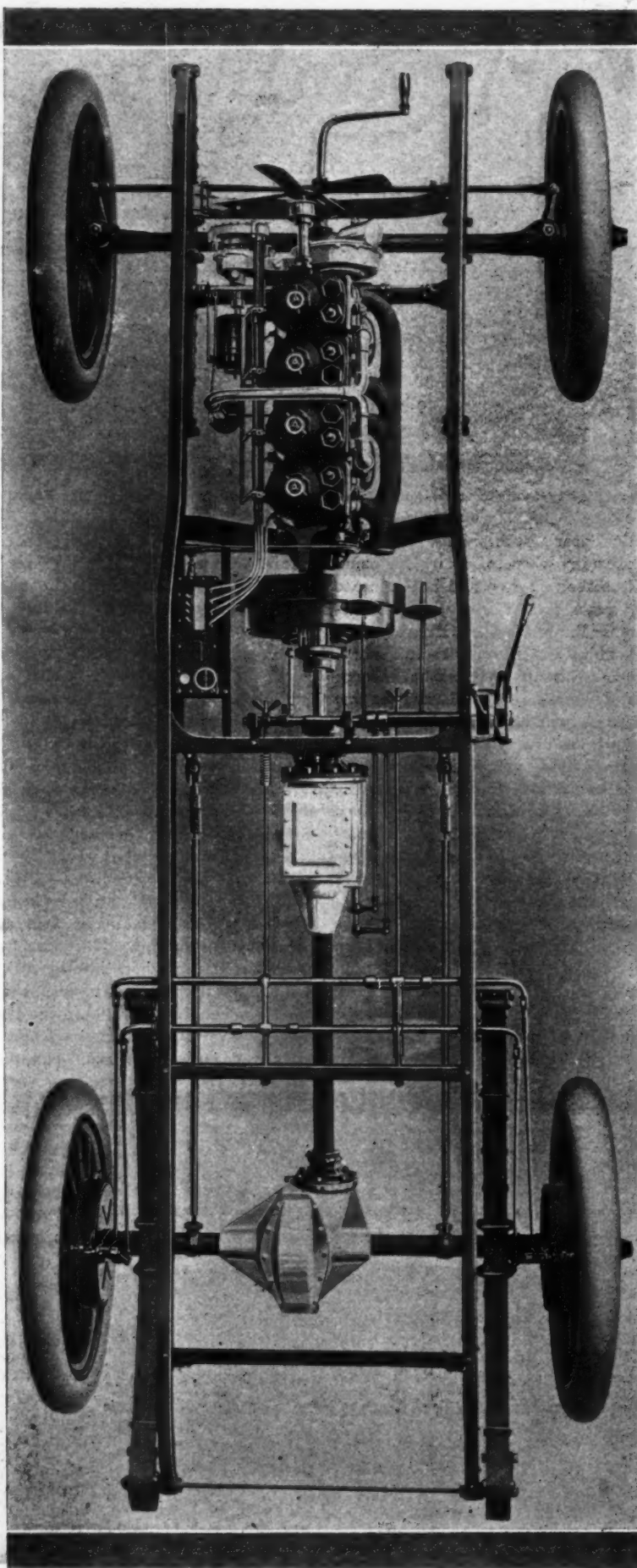


Magneto and Water Pump Side of Forty-five-Horsepower Engine

justment of the main bearings is new, but possesses much of sterling worth, which will lead to extensive duplication. The upper part of the bearing housing is milled to a taper surface. This rests against a taper block which presses on the crankcase. To adjust, one tightens up the two bolts which move the block, the amount of motion of the nuts determining the movement of the bearing. The taper being slight, this can be regulated very accurately, even to thousandths of an inch.

Some Other Engine Features—In the 1910 model the pump has been moved to a position forward of the cam gear case. This change is to provide for a more accessible magneto location. It is now located on an extension of the pump shaft just back of the cam gears. It can be very easily reached for both inspection and adjustment. The magneto is placed on a shelf which is attached to the plain side of the crankcase by means of three studs. The magneto itself is driven through a slip joint, so that it may be lifted out of place for inspection, adjustment, or repairs. This may be effected as soon as it is released, which is done by taking out the holding bolts, four in number. The top or delivery end of the pump is carried over to the center and up, so that from the delivery end to the cylinder water inlets is a straight line, as soon as the right-angled turn has been passed. This makes the water-inlet piping very simple, consisting as it does of a single straight pipe, with the attaching cylinder flanges as the only projections.

Three-point suspension is effected for the engine by the use of a front supporting tube, which passes through the upper portion of the crankcase and forms the two forward points. The rear point is formed by the I-section cross member, which drops down from the level of the main frame so as to pass below the rear end of the case. The upper surface of this is milled out at the center, and the lower portion of the rear of the case has a circular pad at its lowest point, which is machined to match the finished surface of the support. The whole forms a sort of cradle upon which the rear end of the case rests. The front support, or tube, is carried by another I-section drop-forg-



Chassis View Showing Construction and Placing of Parts

ing, attached to the main frame at the sides. This, too, drops down so as to pass under the case at the front end. While actually unnecessary this makes an excellent stiffener for the forward end of the frame, so that its use is a good feature. The tube is not used as a support alone, the spark and throttle levers being pivoted upon it. This saves weight, as otherwise brackets would have to be used. These would require attachment to the frames, and the total weight of brackets, bolts, etc., would be considerable—enough at least to be worth saving.

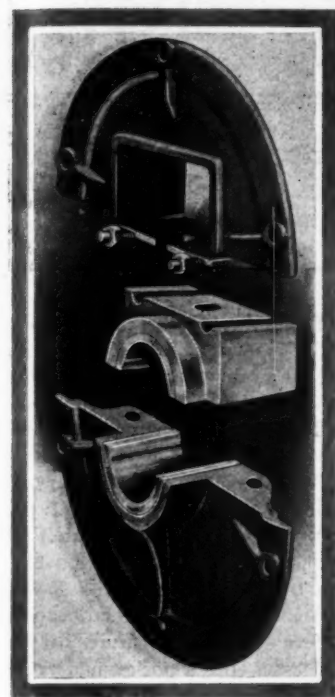
In the interest of convenience and simplification, the compression cocks have been located in the side of the compression chamber, on the back or left side of the cylinders. In this position, a single bar connects the operating levers of all of them. This bar is prolonged, and may project either through the dashboard or forward through the radiator. In the former position, it is handy for testing the compression while running the car, and without leaving the seat. In the latter location, it is handy when starting, in that the slightest movement of the bar lessens the compression in all four cylinders, thus making starting much easier, and consequently less dangerous.

All of the accessories are driven from the engine either at the forward end or from the rear. The fan, for instance, is hung from a bracket attached to the front cylinder. In this position it is driven from the crankshaft extension by means of a large diameter pulley and through the medium of a wide flat belt. The fan is of large diameter and has four blades. The mechanical oiler is placed at the left side of the frame, just opposite the clutch and operating mechanism. This is the point where

the frame widens out, and there is a considerable space there. To utilize this otherwise waste space, a short angle in combination with the main frame forms a small sub-frame upon which the oiler is fixed. This brings the forward end, carrying the driving pulley, opposite the end of the camshaft, from which the drive is by belt. The driving pulley is located on the rear extension of the camshaft, and drives across the car in a straight line to the oiler. The leads proceed to the various points to be lubricated, with the single exception of a sight feed located on the dashboard, in front of the driver.

A new feature which will be found on the 1910 models only is the provision against the usual dropping of oil from the crankcase ends. This consists of a combined shield and oil gutter attached to the crankcase at the rear of the flywheel and main bearing, which returns all surplus oil that may work through this bearing back to the crankcase. This eliminates the possibility of its dropping on to the flywheel and being thrown on to the other parts of the mechanism.

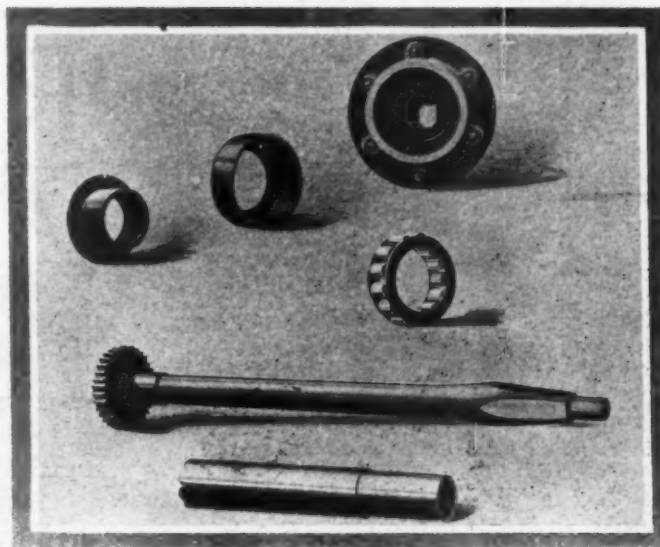
Big Changes In the Clutch—In models Fifty-five and Fifty-four chassis the clutch has been changed from the cone type to internal expanding. This eliminates end thrust on the crankshaft and its design is such that it exerts the greatest pressure when fully engaged. With the average clutch, the spring is expanded when the clutch is engaged so that it then exerts the least instead of the maximum pressure.



Wedge Adjustment of the Engine Bearings

This clutch has been very thoroughly tested on a number of different cars, and has been found to be ideal in operation. It engages very gradually, holds positively, and disengages instantly. In model Fifty-three, the lowest priced car of the line, the clutch remains unchanged, that is, it is of the cone type, with readily accessible external adjustment of the coil spring.

Meritorious Features of the Transmissions—All of the gear boxes afford the same number of speeds, three forward and reverse. They are all of the selective type of sliding gear, also. The cases are of aluminum, closed at the front end by a cast-iron circular plate. These cases are of the barrel type similar to the engine cases, and large hand-hole plates located on the top correspond to the plates on the side of the engine case. This forward plate carries the stresses from the drive and is connected to the bearing at that point. This bearing is located on a cross-member placed there for the particular purpose of



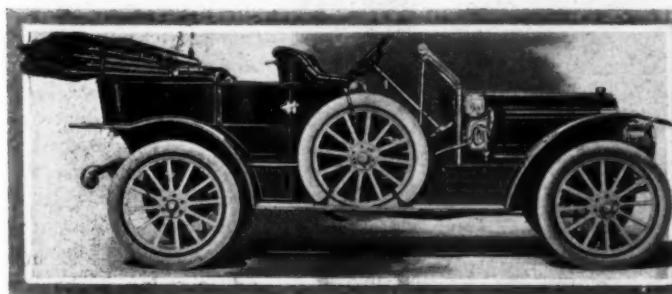
New Rear Axle with Roller Bearing and Other Parts

supporting the combined joint and drive bearing. The only change in the transmission is at the roller bearing which carries the forward end of the main drive shaft. This is a hinged bearing with a dowel fastening, retained in a steel case and provided with adequate means to compensate for all end thrust.

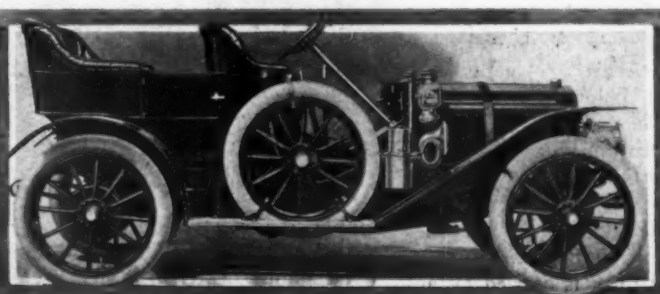
The rear bearing of the gear case is carried backward for quite a distance, while the forward end of the differential case is similarly carried forward toward the transmission. The two projecting ends carry the tube which houses the driving shaft, and the additional length renders the construction firmer.

Axle Changes Slight Refinements Only—The rear axle continues of the semi-floating type but the drive shafts are larger and a new method is used for securing the wheels. On the Rambler drive shafts, the differential gear is upset on the end of the shaft, making the drive gear and axle integral. Now, the wheel end of the shaft is also upset. This enlarged end is squared and tapered for the forged wheel hub. This method of upsetting or enlarging the shaft before squaring it makes it strongest where otherwise it would be weak.

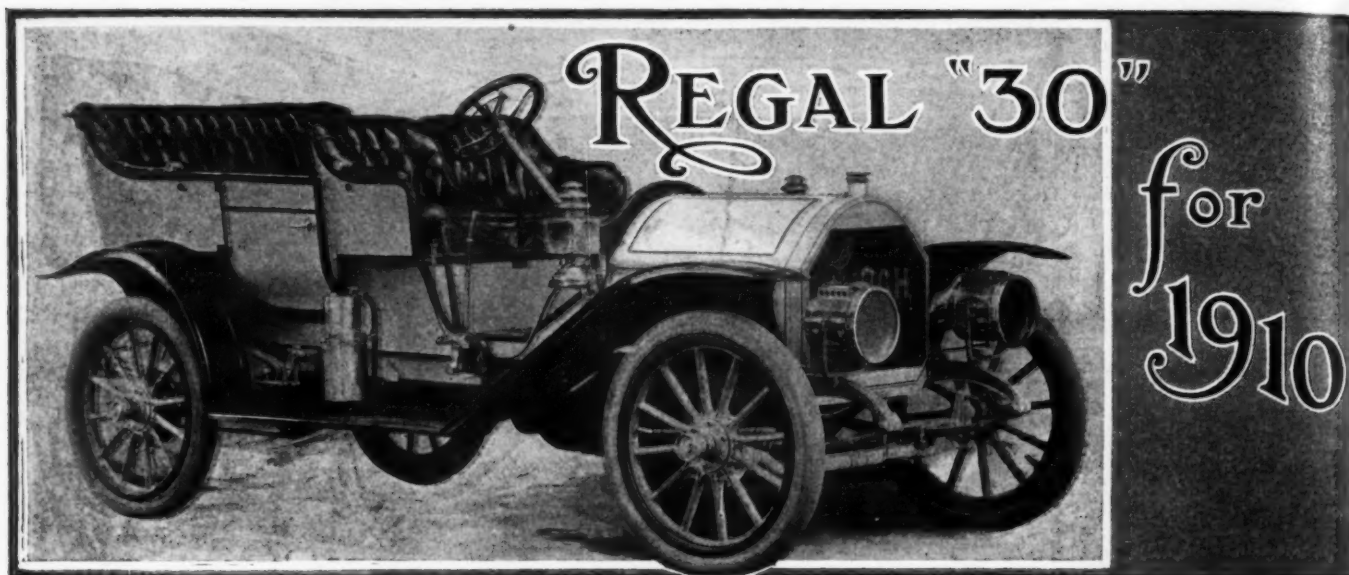
To list the five models as concisely as possible, these are: Model Fifty-five with seven-passenger touring body and with seven-passenger limousine; Model Fifty-four in five-passenger touring style or four-passenger close-coupled body; and Model Fifty-three, which is only made as a five-passenger tourer. Fifty-five has a 45-horsepower engine, 36-inch wheels, 123-inch wheelbase and 4 1-2-inch tires for the touring car. The same chassis fitted with 5-inch tires serves for the limousine. Model Fifty-four also has a 45-horsepower engine, but the wheelbase is shorter, 117 inches. The wheels are 36 inches in diameter, and the tires, 4-inch. On the lowest priced car, Model Fifty-three, which is almost a duplicate of last year's model Forty-four, is used a 34-horsepower motor, 108-inch wheelbase, 36 wheels, and 3 1-2-inch tires, with 4-inch fitted as an extra at \$20.



As Model "Fifty-five" Appears with Top and Windshield



Rambler Model "Fifty-three" Five-Passenger Touring Car



STABILITY, when it is realized, is a readily recognized quality, and in the Regal 30 car, owing to the satisfactory performance of the 1909 model, only minor deviations were considered desirable, it being the idea to take advantage of experience gained in turning out 2,000 of these cars during the past year, and bring the model up to date in point of general external appearance as well as mechanical details.

External appearance of the latest model will best be gleaned by scrutinizing the halftone of a photograph of the car, and, in the doing, observe that the lines are in good taste and the side entrance is wide, due to the lengthened wheelbase, which was increased by two inches, making the same 107 inches. In order to improve further the appearance of the car, the dash is curved, and highly finished Mexican mahogany is used for the purpose.

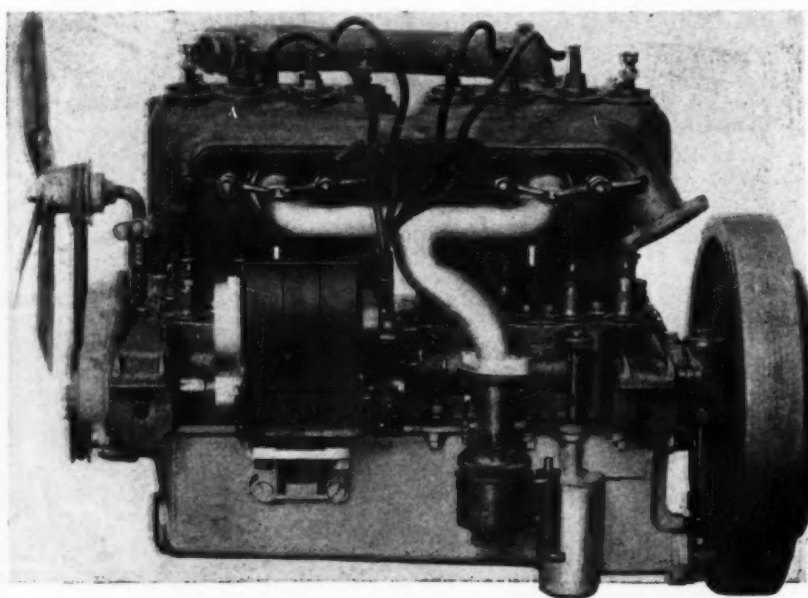
It is not wholly the roomy body that makes the new car so pleasing, for in addition the spring suspension is refined to a high state of perfection, and full scroll springs in the rear take care of all longitudinal tendencies as well as the vertical bounce induced by road inequalities. Then, the wheels are big in diameter, using 32 x 3 1-2 tires front and rear, which selection also affords the advantage of reducing the spare tires usually carried to a single casing. This feature is well worth while.

The body is of metal, highly finished, due to twenty separate coats of "rough stuff" and finish, of a quality designed to afford permanence. The framing of the metal body is designed for lightness without sacrificing strength, and the metal work is so placed as to hold its shape, offering the additional advantage of not being susceptible to dampness, checking, etc. The body is stoutly ironed, all the fittings are good and particularly neat in appearance, and the upholstery is leather of selected grades, neatly tufted, and the cushions are in full accord with the usual best requirements.

Mechanical Features of the Regal—Since the general view offers the advantage of depicting the exact appearance of the car, it is believed that all ends will be served if the design of the car as a whole and working drawings of some of the most important assemblages are presented at this time, with a view of discussing the details. The motor is of the four-cylinder, water-cooled type, with L cylinders, and the valves are located on one side. Cooling is by thermo-syphon; hence, in the list of accessories, there is no water pump, and the radiator, located on the center line of the front axle, is especially designed to prevent steaming, whether the car is running at any of its speeds or standing at the curb. The reason why the radiator does not steam will be understood by referring to the features of it. The force of any entrained steam passes into a pocket and there divides, part of the water passing downward, and the balance going up; but any entrained steam, instead of oozing out through the overflow, has its heat abstracted from it by the water it has to mingle with, and is therefore liquefied.

Exposing Details of the Motor—To understand the refinements in design, it will be better to examine a cross-section of the motor, cutting through the center line of one of the cylinders. The cylinder walls are of even thickness, with a generally symmetrical design and valves of adequate area to assure maximum power. The passageways are of even contour, free from obstructions, and designed to abort back pressure on the exhaust side, as well as to prevent an excess induction depression anywhere.

Compression space is calculated to afford the greatest amount of power, favorably influence conditions of ignition, and enable the motor to perform under severe conditions without laboring. The crankcase is of circular section and great strength. It is vented by means of a large "breather" tube, so placed and baffled that oil will not splash up and out, or silt drift in.

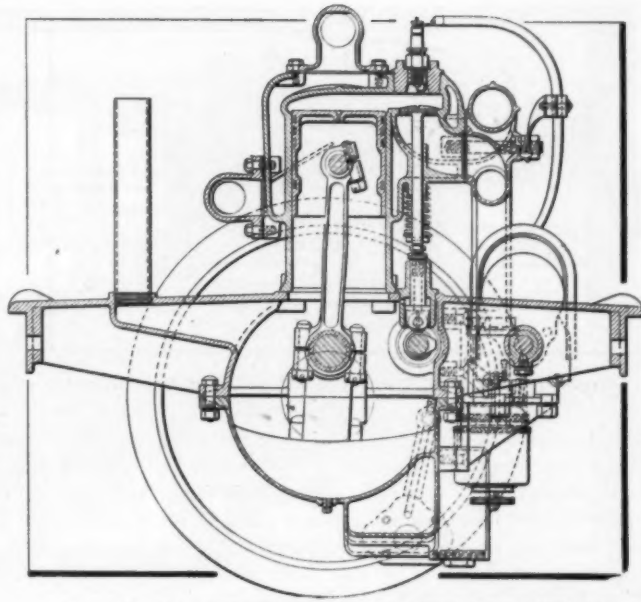


Motor, Showing Magneto, Carbureter and Adjustable Fan Bracket

The pistons, which, like the cylinders, are of a fine grade of gray cylinder iron, are light enough to limit inertia troubles at high speeds and strong enough to sustain against maximum pressures. Four rings are provided, so made and fitted that compression leakage is prevented. This condition is permanent, owing to liberal bearing surfaces, machining close to limits, and low pressures, both as respects surface and in the fiber of the material. The piston pin is of heat-treated alloy steel, hardened and ground to exact size, thus assuring stability of fit, absence of lost motion, and kinetic qualities to resist the severe shocks of ordinary use.

Crankshaft and Connecting Rod—The connecting rod is of the I-section, designed for strength and light weight, has a take-up bearing at the piston pin, where it is suitably bushed and provided with a clamping bolt of ample proportions. At the crankshaft end, the connecting rod is very carefully designed to eliminate every fraction of excess weight. Brasses are lined with a fine grade of white bearing metal, and, in fitting, all bearings are blued and scraped by men of skill in this process, to assure perfect bearing and an even pressure at all points. The crankshaft is drop forged from a special grade of crankshaft steel, is heat-treated to render material highly kinetic and to improve the qualities of the bearing surfaces. The crankshaft sections at the different points are carefully designed to assure a low limit of the extreme fiber strain, and bearing surfaces are on a basis of safety.

Lubrication Is Positive—While the positive system of lubrication is used, it will be worth while to note that in this motor the oil level is maintained by means of an overflow system to a "sump," which shows in the bottom half of the crankcase, to the right. When the oil enters this space, it is lifted by a gear pump of excess capacity, passes up through passageways in the case, and is shot out against the bearings to be lubricated, which bearings are suitably provided with channels for the purpose. The result is, the lubrication is profuse. Since it is important to know how much lubricating oil there may be in a system, the motor is provided with a tell-tale so located that it may be readily seen, and is actuated by means of a float in the oil well, but it is so arranged that the glass will not coat over and hide the readings. The float is of cork, and operates much the same as the float of a carbureter. This is fixed at the lower end of a vertical rod, upon the upper extremity of which is attached the indicating disc. The latter thus moves up and down, with the float which marks the oil level, and registers the same on the gauge glass, the same being visible to the driver

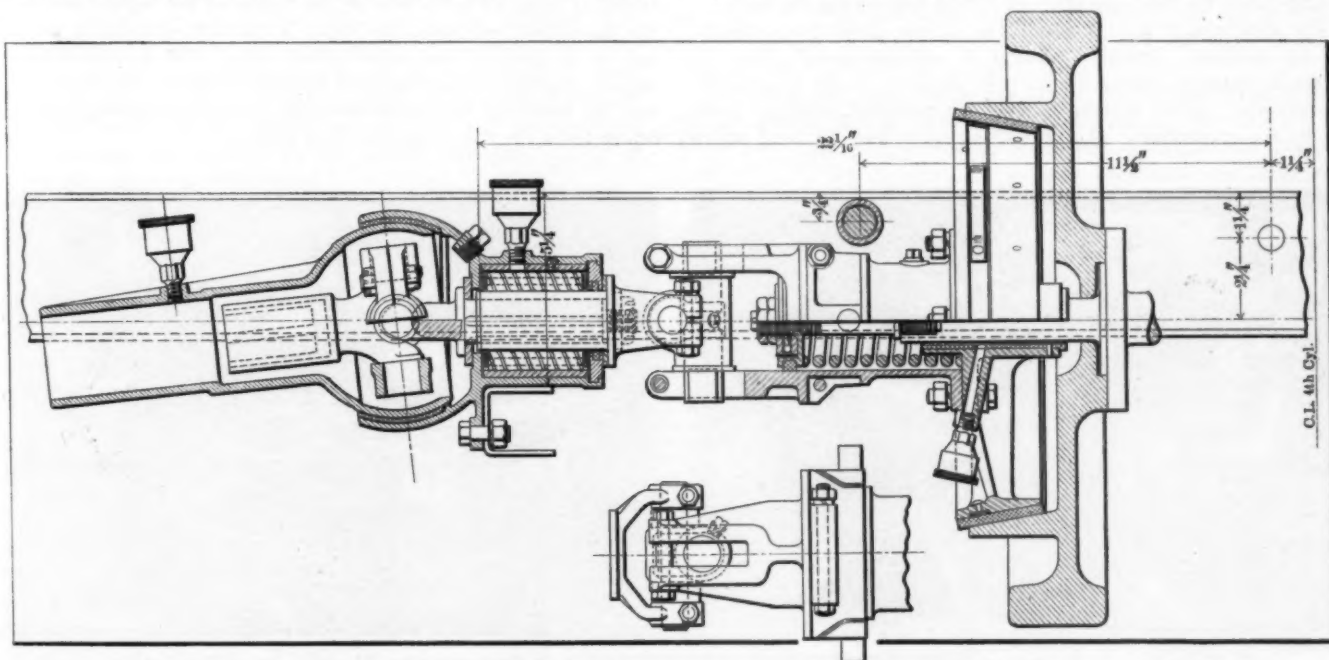


Cross Section Through Engine Displays Large Valves

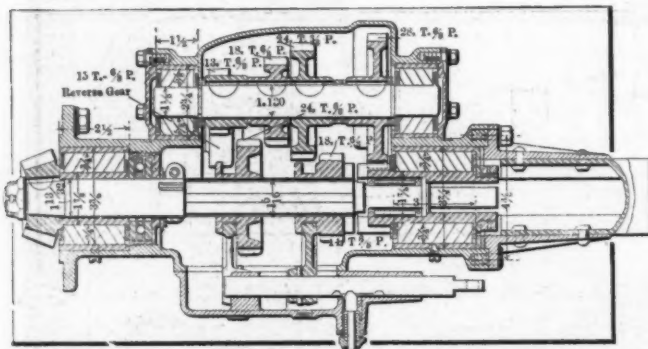
from the exterior. The fan bracket has also been changed, and is attached to the front cylinder with proper adjusting means.

Among the remaining important points to be noticed in the motor, attention will be diverted to the means for adjusting the lift of the valves, and since an integral camshaft enables the use of proper-sized rollers on the ends of the lifts, the actual clearance for the tappets is a minimum, and tappet-knocking is eliminated. The valves are of adequate area to do the required work and it was not necessary to make the lift pronounced, with the result that noise tendencies and hammer blows are not present. With ready means for adjustment, which consists of a nut and lock at the end of the lift, it is an easy matter to retune the motor.

Three-Speed Selective Transmission—Referring to the cut of the transmission—which lies in a direct line to the rear of the motor—this is suspended on the propeller-shaft tube, and the weight is borne by the chassis lateral stiffener and rear axle. The housing for the shaft between the clutch and the transmission is a large and stout tube, while the joint is not only capable of supporting thrust and tension, but it is free to respond to all road inequalities. The transmission housing is



Assembled Clutch with Universal Joint, Central Bearing, and the Relating Parts—A Very Neat Assembly



Regal Three-Speed Transmission, Showing Compactness

relatively small, of light weight, shaped for strength, and holds the gear set centered in Hyatt nickel-steel roller bearings of liberal proportions. The gear shafts, both direct and "lay," are short, of liberal sectional area, hence rigid in the extreme, rendered more so by the use of a selected grade of nickel steel, the gears, as well, being of this material.

Elsewhere in this article, a cut shows the leather-faced cone clutch of suitable diameter. The leather is pressed out by flat springs disposed around the periphery. The clutch spring is strong, and a ball-bearing takes the thrust. Just back of the spring, a joint engages a roller bearing, which, in turn, rests on a cross-member of the chassis frame, so that all stresses are transmitted to the frame just in front of the propeller-shaft tube, close to the axis of motion of the universal joint. All rear axle torsional moments are resisted by the large tube, relative motion is cared for, and the spacing between the axle and the joint is maintained in the same way.

Steering Mechanism Makes for Sturdiness—The steering gear, when cut through the longitudinal center, discloses a helical gear mounted on liberal bearings, with provision for taking thrust on both directions and means for taking up any lost motion which may be generated. The housing of the gear is grease-tight, of suitable proportions, and by means of a webbed foot, is bolted to an arm of the motor, thus affording a stable anchorage, which is a guarantee against lost motion.

Ball and socket joints of large diameter (one of which shows in the figure) are provided at every point, and the levers and linkages are made considerably stronger in all respects than would seem to be required. The steering wheel is, of a most substantial design, holding the wood of the wheel in rigid relation, and the levers and rods for the spark and throttle control are enclosed within the steering post, connecting with the spark and throttle levers on top of the steering wheel. The "rake" of the steering column is 45 degrees in touring cars and 54 degrees in the runabout type.

With the power plant of the size used, so located that the moments are in closely-coupled relations, considering a low center of gravity, the adequacy of the spring suspension, and other design features to match, it is claimed by the Regal Motor Car Company of Detroit, Mich., makers of this car, that maintenance will be at a minimum, although, since the power for weight ratio is favorable, the speed of the car is above average expectations. Naturally, the reflections as to the future of this model are on a reasonably certain basis, due to the experience gained from 2,000 cars of substantially this design, which have uneventfully weathered over a year's service.

Besides the customary equipment—as lamps, generator, etc.—each power plant includes a Remy magneto, making a dual ignition system, in view of the auxiliary spark coil, battery, etc., furnished with every car at the price, which is \$1,250.

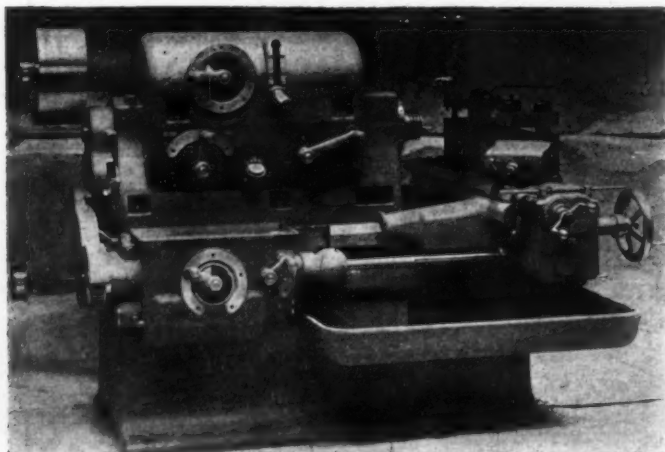
BEVEL TURNING LATHE SIMPLIFIES SHOP WORK

BEVEL GEARS, which in automobile shop work are customarily turned on engine and turret lathes, can be more satisfactorily handled on a special machine recently brought out for this purpose by the Bridgeford Machine Tool Works, of Rochester, N. Y. This machine has been especially designed to turn simultaneously the face, front and back angles of bevel gears and pinions up to 18 inches in diameter. It will also handle advantageously the first operation of boring and facing the back.

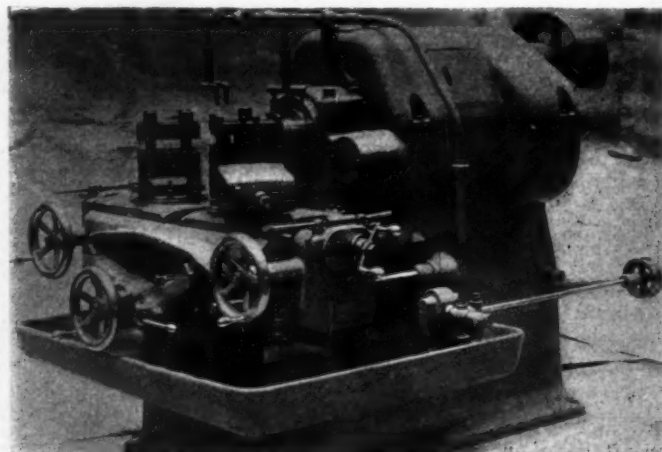
The illustrations give a good idea of the general appearance of the machine. Drive is through a constant-speed pulley, 15 inches in diameter for a 6-inch belt, running at 440 revolutions per minute; twelve spindle speeds are provided, ranging from 5.8 to 214 revolutions. Three cutting tools may be used up to

the limit. The carriage has a travel of 13 inches, and is provided with two cross-slides carrying angle-turning rests, that on the right having a turret tool holder. The feed box gives ten ratios of feed, ranging from .005 to .190 inch per revolution of the spindle.

For the first operation the blank is chucked in a universal chuck and bored with a tool in the left-hand rest, while the facing is done by tools held in the turret of the right-hand rest. For the second operation the blank is chucked either on a special hub or an arbor in the taper spindle hole. The left-hand turning rest carries a roughing and finishing tool for the face angle and the turret of the right-hand rest a set of roughing and finishing tools for the front and back angles.



Left-Hand View of Bridgeford Bevel Turning Lathe



Operating End of Lathe, Showing Angle Rest Hand Wheels

SILENT RUNNING BABCOCK ELECTRIC



Babcock Electric Model 11 for 1910, Depicting a Town Car with the Landau Top

NOISELESSNESS is what designers are reaching for and it is one of the strong claims which has always been made by makers of electric vehicles for their products. In this, a certain amount of natural advantage is a normal expectation, owing to the absence of a power plant of the class involving the use of valves, reciprocating parts, and contrivances of a kindred nature, which make for unavoidable noise.

The natural advantage attending the performance of electric vehicles is not without a disadvantage, in that the very noiselessness of the electrical system accentuates every little sound, and the emanations which would not be noticed in other makes of cars become most annoying in electric vehicles. In going over this question, F. A. Babcock considered that his types of electrics would have to be so constructed that even the hum of the bevel drive in live rear axles would not be permissible. In order, however, to eliminate this slight source of noise, it was considered necessary to do away with the bevel gear, and so the Babcock Model 11 for 1910 is without a bevel drive.

Worm-Driven Rear Axle—In view of the excellent results obtained from worm-gear transmissions of the Hindley type, and realizing, of course, that this system is noiseless, the Babcock designers recognizing certain practical limitations, went into the matter of details at great length. The finished product shows the result of this special investigation and the modifications resulting, one result being the perfect "coasting" ability of the model 11 car, notwithstanding the fact that the average worm drive is nearly irreversible. Usually the worm will readily drive the wheel, but the wheel will not readily drive the worm.

The finished car, which is shown, was designed for town service, it being of the landau type. Referring to the other view of it, the car will be seen with the top down, and certain letters for use in ready reference to the design features as follows: A shows the electrical motor placed on the center line of the chassis, in the fore and aft plane, but with the customary ground clearance. B indicates the location of the elec-

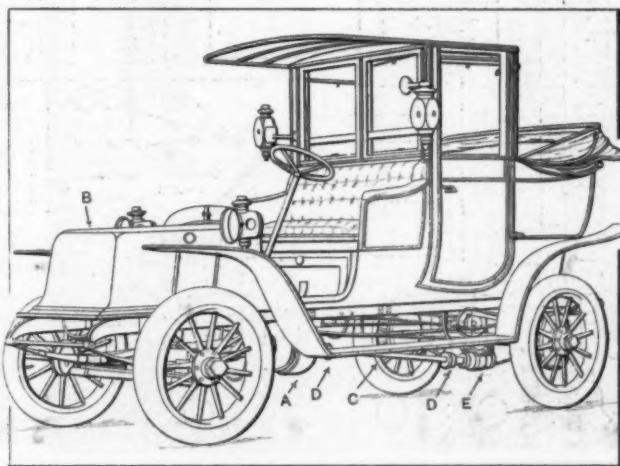
trical battery under the hood, which consists of 42 cells of 15 plates each, with a capacity of 140 ampere hours. C indicates a propeller shaft between the motor and the live rear axle, with double universal joints, D D, so disposed as to eliminate variations in the speed of rotation as well as to compensate for inequalities. E shows the housing of the live rear axle, just where the worn shaft enters and engages with the worm wheel.

The live rear axle, besides having a worm drive, houses a differential of the usual order, but there is one other new detail. The figure shows, in principle, the new idea, a represents the shaft, finished to a square, engaging a broached conical member b, which, in turn, engages a cone face in the hub c, due to the pressure of the nut d. Relative motion is prevented by the keys e, e. It is claimed for this drive, that it has all the advantages of floating, and that it cannot work slack, make noise, nor ultimately require repairing.

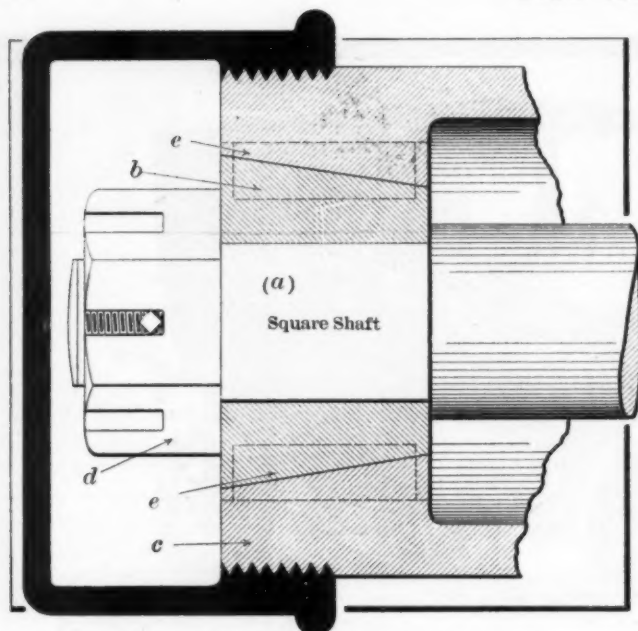
Annular Ball Bearings Used Throughout—To be consistent, and in order to carry out the plan of noiseless performance, it was decided to use a class of ball bearings which could not be adjusted. This idea assures that noise will not be the product of service, plus a "tinker" and a wrench, and the sizes of ball bearings were selected on a liberal basis.

Both front and rear springs are of the "Perfection" type, using Krupp special spring steel. The road wheels are 32 x 4 1-2 front and rear, and a trussed, laminated, wood chassis frame, imparts additional resilience to the whole body structure.

With a motor of great power; battery of ample output, it follows that good spring performance is desirable, and not only in order to please the purchaser by making riding enjoyable, but to eliminate battery troubles, by way of broken jars, loss of electrolyte, etc. In the meantime, in order to insure this performance under the most severe conditions, the Babcock designers, having located the most prolific cause of battery derangement, designed and adopted the plan of crating and holding the battery as shown. The oak crates, or trays, are in



Diagrammatic Design of Babcock Model 11



Conical Drive in Live Rear Axle of Model 11

sets, and when the sets are put in place, the clamping device shown, delivers a uniform pressure on all the jars, independently of the crates, and prevents any relative motion at all.

Dual Method of Car Control—Referring to the wiring diagram, this shows a series motor five speed control, the connections, coming from the rear battery, lead to a drum type of controller, through the contacts numbered 7, 8, 9, and 14, and from the front battery to contacts terminals numbered 10, 11, 12 and 13. From 6, a lead passes to the motor armature, and thence, 1, 2, 3, 4 and 5 connect to the fields of the motor. Contact No. 1 also leads to the lever of the foot control, through resistances 31, 32 and 33, or evading resistance, when the lever 29 bridges to 30.

The several combinations required to give the first, second,

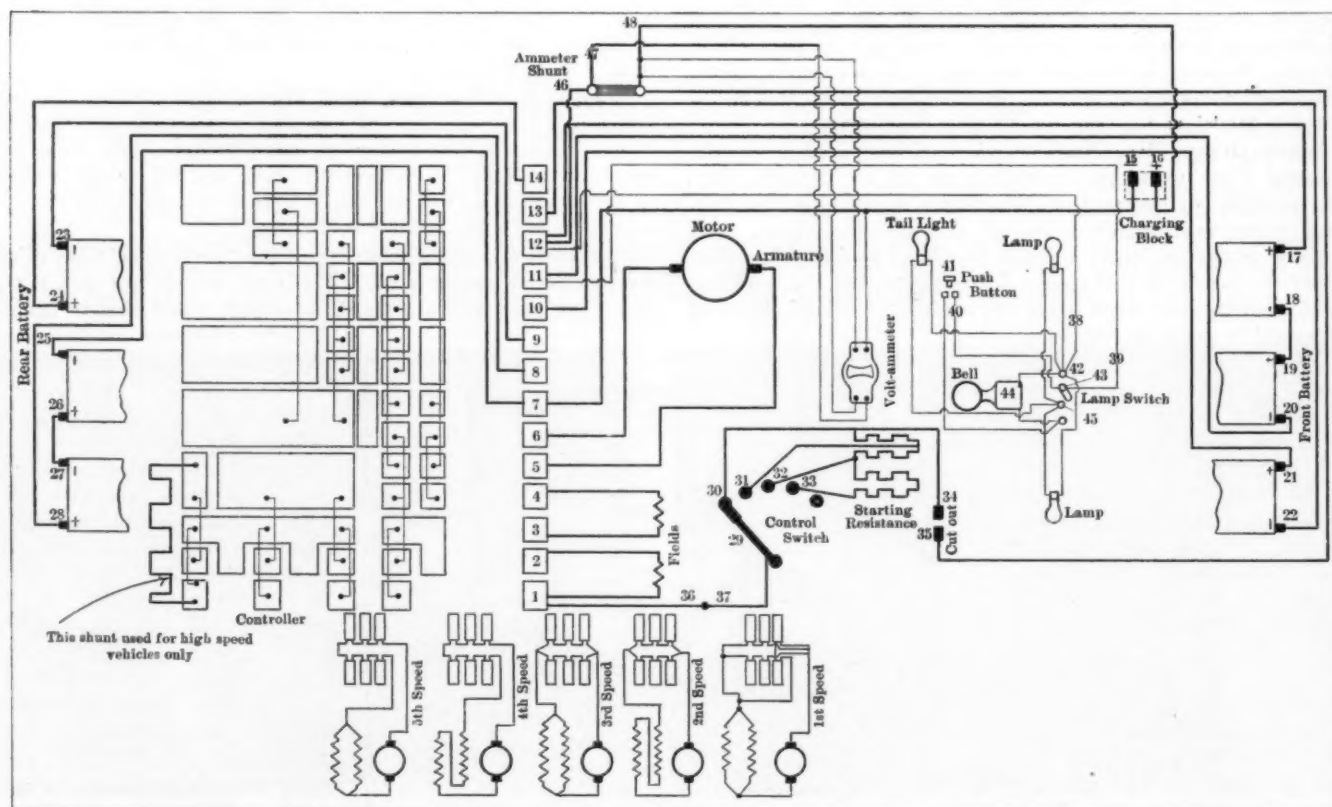
third, fourth and fifth speeds, are shown at the lower part of the diagram, and remembering that the combinations may all be made in succession, by moving a single lever, the time will be propitious to divulge the use of the resistances as above referred to. It is obvious that the control might be made to serve without the resistance, which is but a matter of leaving the lever 29 in the position which bridges to 30, hence shutting off the resistances 31, 32 and 33.

Since the lever 29 may be worked independently of the drum control lever, the operator of a car has two choices, i.e.—the five separate speeds may be used by means of the hand lever of the drum control, without resorting to the foot lever 29, or with the drum control on any one of the five speeds, the foot lever 29 may be used to start, control, and speed the car, up to any limit fixed on the drum control. To go into reverse, however, it is necessary to throw the lever into the reverse position before the foot lever will be of any service. Of the remaining connections, little may be said, since they are for lighting, signalling, charging, metering, etc., nor would it seem to be necessary, at this time, to elaborate upon the advantages of electric lighting etc. The great question involves the principle of the use of separate resistances in the auxiliary control, thus rendering the operation of the car so simple and sure that ladies may drive with safety. Economical conditions obtain, since the resistances are merely auxiliary, serving to abort the consequences of forgetting how the controller may be set, and allowing free use of both hands in a tight quarter by substituting foot manipulation of the resistance lever.

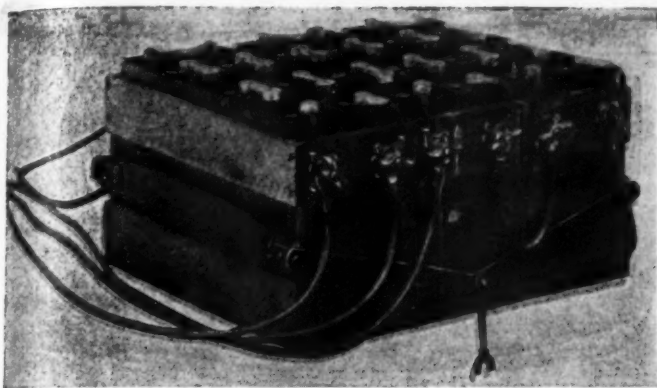
Details Are Worked to a Fitting Conclusion—The Babcock battery is of the type as originally brought out by Camille Fauré in 1881, but improvements wrought since that time, have reduced the whole to a wholesome basis involving qualities as follows:

(A) Considering a single motor drive, the greatest possible torque, and highest desired speed of the car. The torque realized assures that the car will negotiate deep snow, soft going, etc., while the speed on good roads is all that can be desired.

(B) The wiring system is protected at every point by the use of American Circular Loom, which is an insulator of permanence, and acid proof to all intents and purposes.



Wiring Diagram of All Models of Babcock Electric Carriages, Showing How Dual Control is Carried Out



Babcock Clamping Lock for the Battery Cells

(C) All terminal connections are made of non-corroding Tobin bronze, sufficiently so to assure that bad contacts are not induced, and electrical troubles of this character are aborted.

(D) The sizes of conductors used are such that undue heat-

ing is not possible and the "drop" in the electrical system is therefore within economical limits.

(E) Speed combinations are as follows:

First speed: Three groups of 14 cells of battery in parallel, and motor fields in parallel.

Second speed: Two groups of 21 cells of battery in parallel, and motor fields in series.

Third speed: Two groups of 21 cells of battery in parallel, and motor fields in parallel.

Fourth speed: All cells of battery in series, and motor fields in series.

Fifth speed: All cells of battery in series, and motor fields in parallel.

(F) Flexibility of control, economy in the use of energy, insurance against mistakes of the operator, and absence of noise, without sacrificing harmony in any of the important relations, is the fitting conclusion.

Pedal control as outlined above renders the car more readily controlled, as, for instance, in the case of a woman driving, so that this method is bound to result in even greater popularity among the "weaker" sex, with whom it is already very popular.

AUTOMOBILE INVADES SOUTH AMERICAN HOSPITAL SERVICE

WHILE no one has ever set a limit upon the possibilities of the commercial car, it is generally supposed that it has a limit. What this limit is, is hard to ascertain, for every day sees some supposedly immune field invaded by the gasoline-driven car. Time was when the machines were noisy, but the silence of the modern car has done much to open up new opportunities for it. One of these is that of hospital service.

In this line, the superior speed and immunity to fatigue, give it at once a big advantage over the horse, as soon as the prejudice against the machine can be removed. This statement holds particular weight in warm countries, where the horses and other beasts of burden have their already small amount of usefulness still further reduced. The illustration below shows a car designed to replace the unreliable horse in a situation of this sort. It is the Pope-Hartford ambulance purchased by the municipality of Rio de Janeiro, Brazil. In this city, it supplanted several antique French cars. The body was mounted upon the regular chassis for commercial use, this being equipped with a 40-horsepower engine, three speed transmission, 130-inch wheelbase, standard tread, 34-inch wheels, 5-inch tires, and a special sixteen-gallon fuel tank.

Upon this chassis is mounted the body which was built after the special plans by the Navy Department of Brazil. It is very striking in appearance, for instead of the dark colors generally used on ambulances, it is painted with a soft French gray. This makes it more appropriate for use in a warm climate. One of the features particularly distinctive of this ambulance is the top. Here an entirely new idea has been put into effect. Instead of the closed roof, devoid of any means of ventilation, usually employed, this ambulance has what is called the "trolley" top. In this the top is carried up a little way above the sides, giving room for four oblong windows on each side and two both in front and in back. This adds wonderfully to the comforts of those within and gives the machine a distinctive appearance.

Upon the interior has been spent even more time than on the exterior, for as a matter of fact, any old outside would do, if only the facilities for handling patients were adequate.

Its inside finish is in mahogany and is very roomy. There is every conceivable contrivance for the comfort of the sufferer. The details of inside equipment are as follows: Four beds with springs and mattresses made of best curled hair and covered with plain leather. These beds are arranged on slides and rollers so that they can easily be taken in or out of the wagon, and a locking device is provided so that they can be held firmly at any position. There are four stretchers of rubber cloth and four pillows similarly covered. Two medicine chests are provided with compartments for the physician's case, cotton, and splints. There are two folding seats for the nurses, surgeons, and attendants.

Long wheelbase, large wheels, large diameter tires and proper springing will go far toward making this car ride easy, as easy as would be necessary in a vehicle for transporting the injured, while a special gear ratio allows of high speed, as in the case of a hurry-up call, accidents, poisoning cases, etc.



Special Pope-Hartford Ambulance for Brazilian Navy Department

AFTERMATH OF THE LONG ISLAND STOCK CHASSIS DERBY

LONG ISLAND roads have been famous since the earliest days of automobiling, and have been made classic by the Vanderbilt Cup races, yet few, even of those who knew them best, supposed that they would yield such a marvellously fast course as that which connects in triangular fashion Riverhead, Mattituck and Centerville. There had been the usual advance reports of fast time made in practice, and these had been taken with the proverbial grain of salt. The awakening, however, came in the very first lap of the September 29 race, when the time of the three-year-old Mercedes formerly owned by W.

K. Vanderbilt, Jr., was announced as 19:20, a speed of 70.5 miles an hour for the 22.75-mile course. Chevrolet and his Buick came not so far behind, with a record of 69.2 miles an hour. The same combination made the fourth lap in 17:40, a rate of 77.3 miles an hour, and finished, as everyone now knows, at an average speed just short of 70 "per."

The grandstand received the first notifications incredulously, and Announcer Prunty was requested to repeat them several times. After the race the Motor Contest Association gave out that the surveyor who measured the course had filed a sworn statement attesting that the length was really 22.75 miles, measured on the crown of the road, and that the steel tape used had been sealed by the supervisor of weights and measures. Thus the correctness of the measurement seems well attested. The timing was done by the Warner electric timing machine, presided over by the inventor himself, and supplemented by the New York Timers' Club, which obviates any possibility of error on that side.

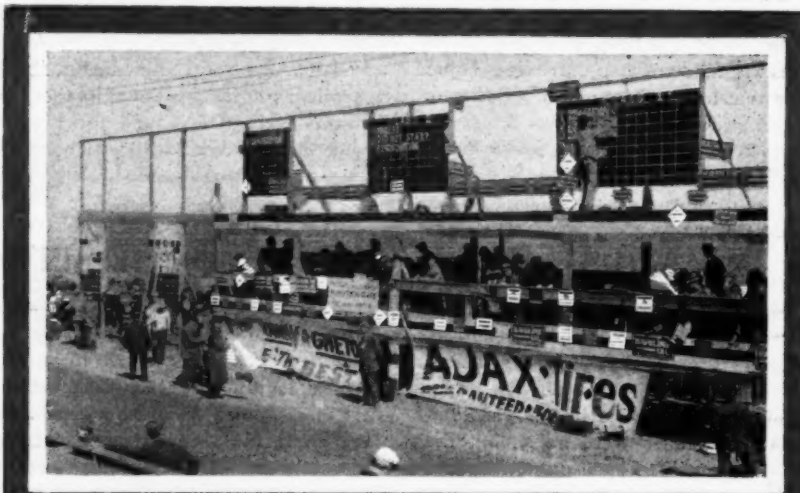
One explanation of Chevrolet's fast time is, of course, the shortness of the race, as the class he was in only went five laps, 113.75 miles. This enabled him to finish without having made a single stop, either for tires or gasoline. Many rumors have been afloat concerning the genuineness of the Buick's claim to be a stock car, but the Buick team has passed the scrutiny of several different technical committees without having been found at fault. Of course the A.A.A. rules for stock cars only specify that twenty-five of a given model must have been made, and it is easily possible for a concern which intends to go in extensively for racing to make twenty-five special cars, call them stock models, and not lose much by it.

Lytle on the Road to Recovery—Herbert Lytle, the plucky driver of the Apperson "Jack Rabbit," is reported to be practically out of danger. He is still in the Eastern District Hospital, at Greenpoint, L. I., but is expected to be well enough to leave in a few days. The surgeons say that he suffered more from shock than any other cause, and the internal complications at first feared have as yet failed to appear.

No authoritative explanation of the accident has been made. Some reports say that it was a plain case of skid. All, however, agree that the Apperson was going at high speed at the time, probably 70 miles an hour.

The American Hot Springs—The American roadster driven by Hugh Hughes caused some excitement in the grandstand when it stopped at the end of the fifth lap. A jet of steam over the radiator cap proclaimed that the engine had become overheated through some derangement in the cooling, and the mechanic, arming himself with a big bunch of waste, leaped to the ground the moment the car stopped and got busy with the cap. When he finally got it off a geyser of hot water, steam and mud shot up twenty feet high, sprinkling the onlookers in the nearby boxes. There was some shaking of heads when the mechanic immediately began pouring in cold water, and many predicted that the American would be put out for good by a cracked cylinder. No ill results became apparent, however, and the American was still running when the race was brought to an end.

Daring Work of Mechanic—Herbert Bailey, the mechanic on Disbrow's Rainier, pulled off a bit of work which marks him as a future driver of no little promise. At least he possesses the requisite agility and nerve. The most hardened racegoers gasped with amazement when the Rainier sped down the home-stretch and stopped in front of its pit with Bailey clinging in some miraculous fashion to the radiator and the front spring irons, holding the steering gear together. On the sixth lap, just after leaving the grandstand, a pin came out of the cross-link of the Rainier's steering gear, leaving the left front wheel adrift. It was, of course, impossible to steer the car with control over only one wheel, so Disbrow and Bailey strapped the link back in place. The repair did not look very secure at that, and finally Bailey climbed on to the spring hangers to hold it in place. He



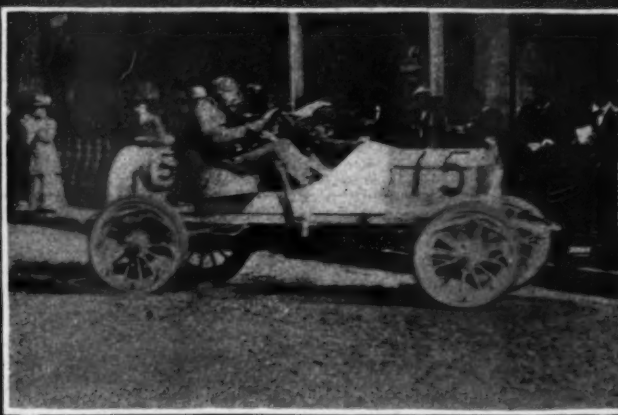
Where Officials and Pressmen Performed Their Duties



Course Was Excellent
De Palma's Fiat in Flight



Chevrolet, Who Averaged 70 Miles Per Hour



Arthur See, Maxwellite, Small Car Winner

needed both feet and one hand to hold himself on the car, but with the other hand he got a good grip on the link. He maintained this precarious position for twenty miles. The Rainier made the lap in a trifle over twenty-six minutes, and Disbrow afterwards said that he did not even slow down for the turns.

The Sharp-Arrow Forgot to Stop—William Sharp's Sharp-Arrow was literally "in a class by itself," and had no trouble winning the trophy for cars selling between \$2,001 and \$3,000. It finished its specified six laps in 2:09:02, a rate of 63.6 miles an hour. Sharp liked the going so well that he kept right on after he had officially finished, and completed three more laps. Some of the spectators did not know that he had finished, and asked for his time, whereupon Peter Prunty informed the grandstand that the Sharp was "just touring." When Starter Wagner finally ordered it off the course it had a five-minute lead on De Palma and his Fiat.

Another Race Next June—It is unofficially announced that another race will be held over the Riverhead course some time next June. Certainly this new course is too good a find to be allowed to drop back into obscurity. Without doubt it is the fastest course in the country. The roads are of loam and sand, but rolled hard and smooth and plentifully oiled. They seem to be especially easy on tires. There is some doubt as to how the surface would stand the strain of some twenty heavy cars at full speed for ten or more laps, but for comparatively light cars and short distances it is certainly unexcelled.

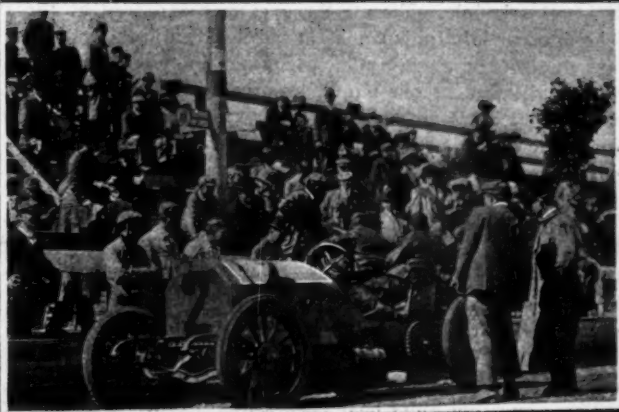
Senator Morgan said immediately after the race that he would retire from participation in such events, but when assured that the accident was in no way the fault of the course he reconsidered his decision, and will probably have charge of the race next June. Many contingencies remain to be provided for; the

consent of the county officials must be obtained, and another sanction must be issued by the A.A.A., but every effort will be made to give the racing teams another chance to show what they can do on the Long Island circuit.

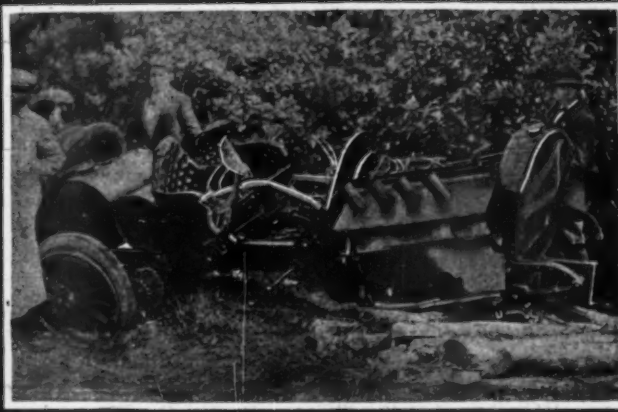
Nearly All Cars Made Good Time—With remarkable uniformity nearly every car except those in the smallest class made at least one lap in excess of a rate of a mile a minute. The old reliable Mercedes scored one lap, the third, in 18:49; De Palma's best was the seventh, done in 20:56. Disbrow's Rainier made the second lap in 21:53, and his comrade Lund drove the sister car over the third lap in 22:00. By a coincidence Disbrow and Lund both made the second lap in 22 minutes flat. The Palmer-Singer, the only six-cylinder car in the race, made a record of 20:05 for the second lap, and the Sharp-Arrow, not far behind, covered the third in 20:56. Chevrolet made the fourth in 17:40, and Burman's best was the second, in 19:50. Most astonishing of all were the times recorded by the little Maxwells; See covered the course in the time of 25:03 and Costello in 25:43, both at the rate of about 54 miles an hour.

MANY CLUBS FORMED IN COLORADO

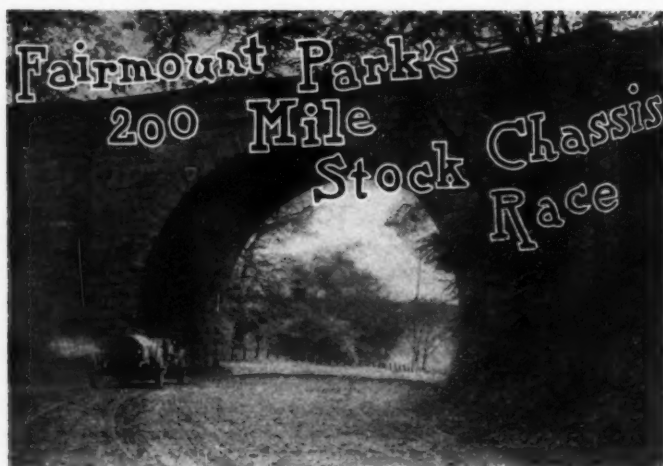
DENVER, COLO., Oct. 2—There has been much activity in this part of the country in forming new clubs, and in this the Denver Motor Club has taken a considerable part. Among the organizations recently reported are the automobile clubs of Greeley, Ft. Collins, Boulder, Longmont, Colorado Springs, Pueblo, Trinidad, Canyon City, La Junta, Ft. Morgan, Julesburg, Rocky Ford, Florence, Las Animas, Grand Junction and Glenwood Springs, and those of Cheyenne, Wyo.; Tulsa, Okla.; Garden City, Kan., and Imperial, Neb.



Mercedes (Armstrong) Withdrawn Because of Accident



Herbert Lytle's Apperson After the Fatal Plunge



A Picturesque Roadway That Is Part of the Course

PHILADELPHIA, Oct. 4—The first gun of the coming contest for the honors in the Fairmount Park 200-mile stock chassis race next Saturday was fired this morning when the 7.8-mile course was opened at daylight to a dozen or more anxious entrants who were on the ground to try out their cars and become acquainted with the course. There are twenty-one entries in hand, with one, and possibly two, additional starters, which will be announced later. At a meeting of the contest committee of the Quaker City Motor Club last Tuesday evening, the entries of Bergdoll's 120-horsepower Benz and Barney Oldfield's car of the same make, which he entered as of 59.6 horsepower, were rejected, it being the opinion of the majority that the cars did not meet the official specifications of a "stock" machine.

The lineup will include some of the most famous track and road drivers, including Robertson, with a Simplex; Dingley and Lorimer, Chalmers-Detroit; Grant, Alco; Haupt, Thomas; Zengle and Parkin, Chadwick; Wallace, Palmer & Singer; Chevrolet and Burman, Buick; Lytle, Apperson (if he recovers from his recent injuries in time), and several others almost equally as well known.

An examination of the course Saturday showed that it was in 50 per cent. better condition than last year, when not a little new road had to be hastily constructed to round out the circuit. The stretch along the South Concourse is absolutely flawless, as is the combination hairpin-S turn on Sweet Brier Hill. Almost the entire stretch of three miles of the river road along the Schuylkill, which was the worst portion of the course last year, has been worked on until it is in nearly as good condition as the Concourse. The bad turn under the Chamounix bridge has been improved, too, but it is still somewhat lumpy for fast work. After practice hours a gang of men will be kept at work at this point all this week. City Line avenue, as usual, is in the best of condition, while Belmont avenue is being worked upon to get it into mile-a-minute shape. At a previous inspection of the course the committee induced the Park Commission to remove several telephone poles and fire-plugs located at turns, and which, in the event of a bad skid, might cause trouble. All in all, the course will be as safe as human ingenuity and hard work can make it. The main feature which makes for safety is the boulevard width of the roads throughout almost the entire circuit. Fast cars cannot be held up by slow ones, and in this respect alone the course is the fairest in the country.

That the largest crowd that has ever witnessed a similar contest will be on hand next Saturday afternoon is positive. The homes of a million and a half of people are within a five-cent carfare ride of the course, and the half-holiday will bring out every man, woman and child who can get on a trolley car. The police arrangements, as personally looked after by the Mayor and Superintendent of Police Taylor, are perfect. Fifteen hundred policemen, reinforced by miles of rope and wire fence,

will keep the course clear, and additional guards and flagmen will be furnished by the Quaker City Motor Club. At dangerous turns, such as at Sweet Brier Hill, at Chamounix railway bridge and at the Catholic fountain, special care will be taken to protect the public.

Many parking spaces and grandstand boxes were disposed of at public auction last week, not a few of the former bringing 200 per cent. more than the regular price. Many of the boxes also brought good figures, and the expectation of the promoters that at least \$20,000 will be turned over to the four charitable institutions which have been named as beneficiaries, seems in a fair way of being realized.

The main stand is ready for its decorations, and a large gang of carpenters is at work on the official and press stands and repair pits. The latter will be located above and below the tape, directly in front of the big grand stand, thus affording the spectators a fine view of the exciting features attendant upon quick tire changes, taking on of supplies, etc.

'Phone stations will be established at various points around the course, and the scoring arrangements have been under rehearsal for the past fortnight, to insure the prompt and correct recording of the work of the various contestants. The score-board itself will be a vast improvement over last year's crude affair, which came in for no little deserved criticism. A specially drilled corps of men will have charge of the board, while the Warner Instrument Company will supplement the work of the scorers with its patent recording device, which shows the relative positions of the three leading cars.

LIST OF ENTRANTS

No.	Car	Cyl.	H. P.	Bore and Stroke	Driver
1	Acme	6	60	5x5	Mallin Leinaw
2	Palmer & Singer	6	60	4 7-8x5 1-2	Wm. Wallace, Jr.
3	Simplex	4	90	6 1-10x5 3-4	J. F. Betz, 3d.
4	Apperson	4	49.2	Not over 600 cub. in.	Hugh Harding
5	Lozier	6	50	4 5-8x5 1-2	Harry Cobe
6	Benz	4	60	5 3-4x5	Chas. Howard
7	Welch	6	70	4 5-8x5	Al. Hall
8	Thomas	6	70	5 1-2x5 1-2	Willie Haupt
9	Thomas	6	70	5 1-2x5 1-2	L. J. Bergdoll
10	Chadwick	6	60	5x6	Jos. Parkin, Jr.
11	Chadwick	6	60	5x6	Len Zengle
12	Alco	6	60	4 3-4x5 1-2	H. F. Grant
13	Columbia	4	32.4	4 1-2x4 7-10	J. Coffey
14	Welch	6	70	4 5-8x5	E. R. Bergdoll
15	Chalmers-Detroit	4	40	5x4 3-4	Bert Dingley
16	Chalmers-Detroit	4	40	5x4 3-4	L. B. Lorimer
17	American Speedster	4	60	5 3-4x5 1-2	Robt. Drach
18	American Roadster	4	50	5 3-8x5 1-2	E. O. Hayes
19	Simplex	4	90	6 1-10x5 3-4	Geo. Robertson
20	Buick	4	30	4 1-2x5	L. Chevrolet
21	Buick	4	30	4 1-2x5	Robt. Burman

HOOSIERS ENJOY SOCIABILITY RUN

INDIANAPOLIS, Oct. 4—Local owners and drivers held a combined sociability run and hill-climb last Saturday and Sunday, which proved such a success that it is hoped to make it an annual affair. The run was to Mudlavia Springs and back, and a handsome silver trophy, hung up by the Warner Instrument Company, was to go to the driver who made the trip in time nearest a secret schedule. Twenty-three entries appeared at the start. The first car left Indianapolis at 7 o'clock Saturday morning, and was due to arrive at Mudlavia Springs in time for lunch. The others followed at one-minute intervals. The Marmon confetti car, driven by Bernard Saltzgaber, was ditched between Crawfordsville and New Richmond, and Mr. Saltzgaber was slightly hurt. The accident was not so serious as to affect the pleasures of the day.

Saturday afternoon a hill-climbing contest was held on Devil's Elbow, which was won by Carl G. Fisher, driving a Stoddard-Dayton. The return trip, by way of Lebanon, was 104 miles in length. After the return to Indianapolis it was announced that the trophy for the nearest approach to the schedule time had been won by Miss Katrina Fertig, driving a Premier. Her time varied but one minute three seconds from the schedule.

These guessing tours have been a prominent feature of the various Premier tours of the year, and have attained popularity.

ATLANTA WILL SUPPLY SOUTHERN HOSPITALITY



The New Auditorium-Armory Where the First of the Southern National Shows Will Be Held

ATLANTA, GA., Oct. 4—That the citizens of Atlanta are determined to live up to their famous reputation of Southern hospitality and make the Atlanta Automobile Show a record breaker and one to be remembered, is best evidenced by the manner in which professional and business men of the city are contributing to the fund to be used for entertaining the visiting manufacturers, salesmen, and others who attend the Atlanta Show. Already over \$15,000 has been received by the executive committee, and by the time the guests begin to arrive this amount will be increased by many thousands.

Atlanta has been a little envious of her sister city, Savannah, ever since the latter city held the Grand Prix races last Thanksgiving day and took such good care of her visitors. Atlanta now sees a chance of outshining Savannah's hospitality and is doing her utmost to beat all records for entertaining those interested in the motor car industry. That she will succeed is admitted by those cognizant with the plans being prepared.

For a city the size of Atlanta it means a hard task to house the great influx of visitors who will attend the show, and to meet this exigency a public comfort department has been created with S. C. Dobbs, of Atlanta, as chairman. This department will find temporary homes for those attending the affair. A general call has been sent out to the citizens of Atlanta to open their residences to the guests, and hotel proprietors are making every effort to increase their facilities. A general renovation is in progress, and the hotels from now on will be in the hands of decorators and painters putting the Atlanta hostelrys in the best of condition.

Invitations will be sent out to every dealer and garage proprietor in the District of Columbia, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Texas, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Kentucky and Tennessee.

In addition these, which number about 1,100, will be issued invitations to all carriage dealers in the same States, swelling

the number to about 2,000. The courtesies of the show will be extended to these dealers gratuitously. As is well known, the show is being held at the time of year when money is free in the South. The planters have harvested their crops and will receive about \$120,000,000; banks have increased surpluses, merchants and store proprietors have done a good business, and, in brief, practically all the Southern higher class are in a position to, and will, buy motor cars and accessories. All this makes doubly sure the success of the Automobile show.

Racing on the Great Speedway—The great \$300,000 two-mile automobile speedway of the Atlanta Automobile Association was turned over to the owners by the contractors on Saturday last. Monday morning the experts of the Standard Oil Company began their work of oiling the track. This work will probably consume one week's time, and then the track will be ready for the racing men, who will give it the first official test. The management of the Atlanta track is determined that there shall be no imperfections in the track if they can possibly be avoided, and it is with this object in view that they have secured the services of such noted drivers as Robertson and De Palma to visit Atlanta and make an inspection of the track.

The work on the grandstands is progressing to such an extent that they are to-day ready for occupancy, and the bleachers will be finished before the end of the present week. The garages—75 in number—are constructed of corrugated iron, and each one will be provided with all modern conveniences.

The star event of the great five-day meet to be held from November 9 to 13, inclusive, will be the 200-mile stock chassis race for cars from 451 to 600 cubic inches displacement. This race will be for the City of Atlanta trophy, valued at \$10,000. In addition to the trophy, the winner of this race will receive \$1,000 in gold; second prize, \$500 in gold; third prize, \$300 in gold; fourth, \$200 in gold. In addition, there will be other races at shorter distances for various sized cars, together with special match races, pursuit races, etc.

THE AUTOMOBILE

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THE CLASS JOURNAL COMPANY

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WHAT ABOUT OFFSETTING?

One of the stock questions of the past three or more years has been that of the most advantageous offset. Beginning at the time when the practice of setting the cylinders off of the center line of the crankshaft, that is, *de saxe*, as the French have it, there was much argument, pro and con, as to the merits of this practice. The result seems to have been that it won a certain place in the industry; that is, some manufacturers thought it worth while and took it up. Others, and they are numerous, granted the contention that the practice was all right, but would not and do not use it to-day. However, the advantages having been granted, the later question for discussion became the most advantageous offset.

New light has been shed upon this perplexing subject by the results recently published, for the first time, of a number of experiments made for the express purpose of settling the argument. The conclusions deduced from a number of tests of large gas engines, differing only in size and relative weight from automobile engines, are most interesting in that they seem to shed light not only upon this problem, *per se*, but also upon the equally perplexing one of the two-cycle engine. A statement of these conclusions will make this clear, as follows:

A. An offset cylinder may be employed with *least* benefit on a high-speed, four-cycle, vertical engine.

B. It may be employed with the *most* benefit on a slow-speed, two-cycle horizontal engine.

C. The maximum advantageous offset is limited by the side pressure near the beginning of the first stroke, regardless of cycle.

The italics are ours, put in to bring out the desired point; that is, the tests would seem to show that the practice of offsetting is of the greatest utility as applied to the two-cycle motor. From this it is a reasonable deduction that its use in that form of engine will increase the power output of any given unit. This will be of much benefit, since that form has been sadly lacking in this department, for, far from developing an excess of power over the corresponding size used four cycle, in the vast majority of cases there is a large and very noticeable lack of what might even be called equality.

True, the investigator has made the point that the most gain is found in the horizontal type of two-cycle engine, of which very few are built, but it is logical to deduce backwards from this to the statement that the two-cycle vertical would present the next best amount of advantage, using the practice of offsetting. This idea, taken at its full worth, in combination with some one or more of the other modern notions, such as the differential piston, the rotary valve, the slide valve, or fuel injection, should evolve a new and superior type of two-cycle power plant.

NEW YORK SEES WRIGHT FLY

Aviation had its first really public demonstration when Wilbur Wright circled the Statue of Liberty and flew from Governor's Island to Grant's Tomb and back. Other great aeroplane flights have been made on closed fields, or, if in the open, in comparatively secluded localities. Now, for the first time, an aeroplane has flown past a great city, revealing itself to the multitudes in the streets. Several hundred thousand people must have witnessed the flight. Crowds looked on from the Battery, from Riverside Park, and from the wharves on either side of the Hudson; other crowds saw it, at a greater distance, from windows and the roofs; ferryboats stopped in mid-stream, their decks black with passengers staring upward; the crews of the French, German and English warships, at anchor in the stream, lined the yard-arms and cheered.

Considered scientifically, the flight must rank as among the best yet accomplished. Bleriot's passage of the English Channel was longer, both in time and distance, but the course lay over open water; the French aviator's only difficulty lay in crossing the line of English cliffs. Wright, on the other hand, flew the whole distance in close proximity to New York's towering buildings.

TWO-CYCLE SHOWS UP WELL

Advocates of the two-cycle form of construction are elated over the showing made by the Elmore and the American Simplex in the Munsey reliability run. These cars won their classes, and the Elmore won, in addition, the cup for the best performance. It made the remarkable record of being the only car both to finish the run with a clean score and to go through the technical examination unpenalized. In France, too, the two-cycle engine is regarded with more favor than formerly. A car of this type held third place in the voiturette race at Ostend for nine of the twelve laps, being forced to retire by a broken wheel.

SOME COMMENT OF THE MOMENT

President Schurman of Cornell may or may not be an autoist, but he is something of a satirist, judging from a most recent utterance which found its way into print upon his return from Europe. During his travels abroad the distinguished factor in education observed that the aeroplane had produced evidence of its undoubted worth. "The possibilities of flying are so wonderful," said the Cornellian, "and the marked advances of the past summer so promising, that some day the rich young society youth may abandon his automobile for a flying car, thereby leaving the roads to the public again." Dr. Schurman said he looked forward to the time when the roads should be open to "you and me" again. When that day arrives the Doctor will find the great army of law-abiding autoists celebrating with him the disappearance from the roads of the small but inconsiderate contingent which hogs the highways in a criminally reckless manner. In the jailing that must take place there will be others besides rich young men of demoralizing leisure, for while this class is to be seen numerous, the guilty embrace all classes. Sky travel may help to lessen the offenders, but the most efficient remedy is to compel every driver of an automobile to obtain a license, the abuse of which may lead to temporary or permanent revocation.

But there is a natural sequence even for the rational autoist to add flying to his accomplishments, and the industrial phases of these two pastimes have much in common. A recent illustration is W. D. Gash, one of the John Wanamaker department store commanders. Once upon a time Mr. Gash had to do with the making of Orient bicycles, and then motorcycles. Next he figured as a sales manager of the Searchmont, one of the earliest American efforts in automobile manufacture. Subsequently he completed the arrangement whereby John Wanamaker undertook the selling of Ford cars, which idea did not assume the proportions anticipated. When the plan was discontinued, Gash remained in the Wanamaker employ, and now among his varied duties he is giving some attention to the flying machine exhibition at the New York store. Mr. Gash was one of the charter members of the Aero Club of America, and has attended all of its important functions, as in like manner he has continued to keep more or less in touch with automobiling by being present at leading social events and classic competitions.

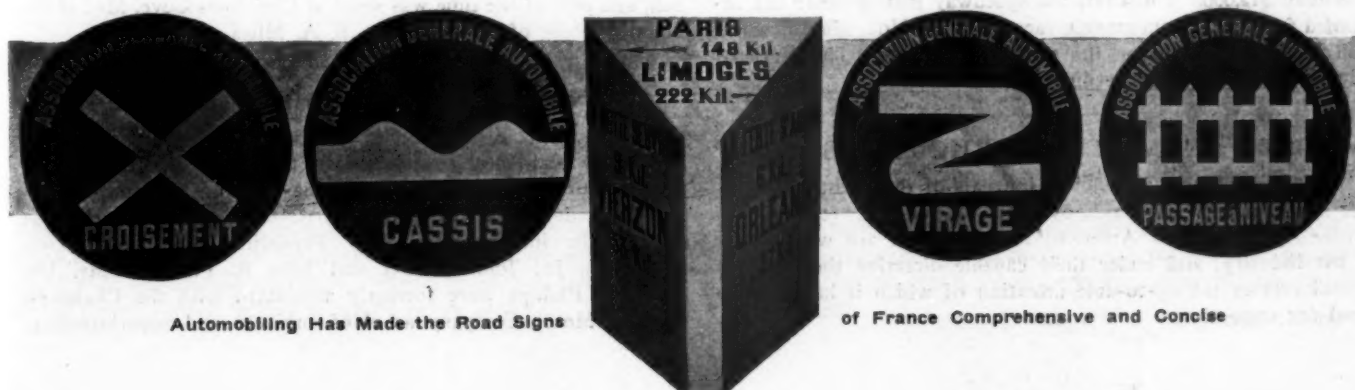
The first cash prize ever offered in this country in an automobile race was over a year ago in a gruelling 24-hour race at the Brighton Beach track in New York City. Montague Roberts, the winner of the race, in a Thomas car, is still looking for the \$1,000 which was supposed to go to the winning driver. In the meantime William H. Pickens, who vouched for the business integrity of one Joseph Gaite, continues to serve as the manager of the racing team of one of the most prominent concerns interested in racing. While the metropolitan club which officered the meet had no business connection with it, except to receive a percentage for its work, it would be an act calling for

much commendation if it contributed the sum toward the meeting of the obligation. Pickens ought to be relegated to the side lines until either he or his theatrical ex-partner produce the unpaid prize. "Heads I win and tails you lose" is flimflam in whatever channel it is practised, and the payment of prizes only when sufficient money comes in at the gate is a thing not tolerated when sport has real government. The improved conditions since the M. C. A. became a factor should include a demand for the settlement of a prize the continued neglect of which is little short of exasperating to the man who should receive it. It speaks well of the winning driver, who did not win, that he has never made a "holler" for the money, nor stirred up a "fuss."

The old Porter House in North Cambridge, Mass., is to become a garage; here it was that the fame of the Porter House steak began. The husky eaters of Boston Town, when their vigorous appetites demanded substantial attention, journeyed to the old Porter House, and many a man—and woman, too—who has enjoyed this succulent cut of the beef will learn for the first time upon this reading the source of its naming. Bostonian chronicles tell not the name of the man who first carved this cut nor the fortunate one who ate it; but it is a matter of record that in the years following its advent the procession of patrons of the Porter House grew in great numbers, and in the ranks were men of note in the affairs of the commonwealth. And now the smell of gasoline is to replace the delicious odor from the grill, with resultant pangs of hunger to those who now will have to search elsewhere for a less historic source at which to appease their longings, for it should be said in the passing that the old Porter House had survived a century and a bit more.

A new wrinkle in the way of automobile persecution in England is the inclusion of the passenger when arrests are made for so-called overspeeding. In a recent happening in the tight little isle a passenger accompanying an arrested driver was mulcted to the tune of £4, which, in good American money, means nearly \$20. In this revised method of apprehending offenders it is not improbable that good results may ensue, for the occupant of the tonneau, when time hangs heavily on his hands, might employ as much persuasiveness as he can summon, verbally and physically, in urging the man at the wheel to lessen his pace so that he will keep within the confines of the law. In some instances the plan might be an excellent one, though it is pretty good guessing that it will not be astonishingly efficacious as a general rule.

One of automobiling's phases is the gradual loss of the so-called "speed-fever" by the older drivers, who nowadays seem to drive quite slowly, even on a good road, instead of extending their cars to find out exactly what they are capable of when utilizing all their power. There are times when one may drive fast, and there are times when one should drive slowly. Discretion in both cases tells whether one is a good or a bad driver.



Automobiling Has Made the Road Signs

of France Comprehensive and Concise

SELDEN DECISION BRINGS STARTLING RESULTS

(Continued from page 591)

To-day's Meeting of the Licensed Association

The A. L. A. M. has its regular monthly meeting to-day, and all these matters of great moment will come before the association. None of the officers of the Licensed body cared to be quoted in advance as to the probabilities, contenting themselves with the expression of an opinion that a broad view was being taken of the entire situation and that the general good of the industry was to be considered. This has been the open expression of Colonel Charles Clifton, president of the Licensed body, for some time past, though he encountered some difficulty in convincing others of the wisdom of his course. His advice is likely to be quite potential at the present moment.

Two Shows Are Still Assured

Believing that two shows are a necessity in New York City, it is probable, no matter what the outcome will be in clarifying the situation, that there will be no interference with the announced plans for the holding of the shows in Madison Square Garden and Grand Central Palace, the latter under the auspices of the A. M. C. M. A. One building could not possibly house all the exhibitors, and thus two separate shows become an actual necessity.

The National Association of Automobile Manufacturers yesterday held a meeting for the purpose of allotting space for the Chicago show, and to-morrow the A. M. C. M. A. will have its drawing for the Palace exhibition.

BAY STATERS TO HAVE AN ENDURANCE

BOSTON, Oct. 2—The contest committee of the Bay State Automobile Association has announced the preliminary plans for an endurance run to be held Friday and Saturday, October 22 and 23. The primary object of the contest will be to give the people of many of the principal cities of New England an opportunity to see the 1910 models in operation and to make comparison of their performances under uniform conditions. According to the plans that have been made, the run will cover approximately 450 miles, the contesting cars making half the distance on each of the two days. On the first day the cars will pass through the cities and larger towns to the south and west of Boston. The route includes Quincy, Holbrook, Brockton, Bridgewater, Middleboro, New Bedford, Fall River, Taunton, Providence, Pawtucket, Woonsocket, Fitchburg and Worcester. The second day the run will be to the north and east of Boston, the principal points on the route being Lowell, Nashua, Manchester, Concord, Dover, Portsmouth, Newburyport, Haverhill, Lawrence, Salem and Lynn. At the end of the road test the cars will be examined by a technical committee.

NOVEMBER MEET ON BRICK SPEEDWAY

INDIANAPOLIS, Oct. 4—The aviation meet which was to have been held at the Indianapolis Motor Speedway, Oct. 14, 15, 16, has been abandoned, owing to the inability to reach satisfactory terms with Glenn H. Curtiss, who refused to participate for less than \$12,000. However, the speedway management has arranged for another automobile race meet for November 1, which will be the first held on the new brick course. The work of paving the course is proceeding rapidly.

WAGNER AND AMES BUY "HORSELESS AGE"

One of the pioneer automobile journals of the country, *Horseless Age*, has been purchased by Fred J. Wagner, formerly of *Motor Age*, and C. B. Ames, of *Motor*. Both are well known in the industry, and under their capable direction the property should receive the up-to-date attention of which it has been in need for some time.

PALACE SHOW HAS RECORD LIST

All records have again been broken in connection with the application for space in the Tenth International Automobile Show, which will open New Year's Eve in Grand Central Palace, New York. When the applications for space to participate in the first allotment closed 110,000 square feet had been applied for, which is about 5,000 square feet more than was applied for last year. With but 72,000 square feet at their disposal, Chairman R. E. Olds and his associates on the Show Committee will experience considerable trouble satisfying the demands of motor car and accessory exhibitors.

Members of the A. M. C. M. A. have fairly swamped the management with requests for increased space, and members of the Importers' Automobile Salon have taken every foot contracted for by that association. David J. Post, who represents the Motor and Accessory Association, is authority for the statement that members of his association have applied for 25 per cent. more space for the Palace affair than at any previous exhibition. The drawing for space will be held at the headquarters of the A. M. C. M. A., 505 Fifth Avenue, New York, at 10:30 o'clock to-morrow.

Opening the 1910 show season the Grand Central Palace as usual will be the first in which are exhibited the products of many new concerns, both motor car and accessory manufacturers. The great quantity of new exhibitors this year has impressed the Show Committee with the growth of the industry since the Grand Central Palace Show of last year.

PLANNING FOR A SHOW IN COLUMBUS, O.

COLUMBUS, O., Oct. 2—At a recent meeting of the Columbus Automobile Club it was decided to hold an automobile show in this city some time next January or February, and a committee was appointed, consisting of Perin B. Monypeny, Fred H. Caley, Herman Hoster, N. O. Aeby and O. H. Perry, to make the necessary arrangements. All manufacturers will be invited to participate, and it is expected that the date will be arranged between those of the Cleveland and Cincinnati shows, so that manufacturers will not be forced to go to unnecessary transportation expense.

The "Old People's Day" proposed by several members of the club has been postponed till next year because of the lateness of the season.

"LUMMY" GOES BACK TO "LUNNON"

A. E. Lumsden, London representative of the B. F. Goodrich Rubber Company, sailed for home Saturday last on the *Cedric* after a two months' visit in this country. The success of the London branch of the Goodrich company is attested by the fact that it has now been in existence for several years under the able direction of Mr. Lumsden, who will be remembered as one of the old-time bicycle champions of America, his base of operations having been Chicago. It is like carrying coals to Newcastle to sell tires in Europe, and salesmanship enters into the proposition as much as quality of goods. Apparently "Lummy" knows how to sell things, and he has something good to sell. He was accompanied on his visit by Mrs. Lumsden and son, and part of the time was spent at Christmas Cove, Me., at the summer home of Mr. and Mrs. S. A. Miles.

NEWCOMERS IN THE INDUSTRY

DETROIT, Oct. 2—The Sibley Motor Car Company has been organized and incorporated under the laws of Michigan to manufacture a popular-priced touring car and roadster. Plans are being developed for quantity production to begin early next year. The incorporators are: Frederick M. Sibley, Henry Wineman, Jr., John G. Utz and John B. Phillips. Mr. Utz and Mr. Phillips were formerly associated with the Chalmers-Detroit Motor Company as chief engineer and superintendent.

INDUSTRY AS VIEWED BY HEADS OF ONE BIG CONCERN

GREATER DEGREE OF CO-OPERATION DESIRED

By H. H. NEWSON, GENERAL MANAGER McCORD MANUFACTURING COMPANY.

The builder of automobile parts is no longer a manufacturer who blindly supplies whatever may be called for by the specifications and blueprints of his customer, but is in the position of an active department of the customers' organization, and consequently must often act in an advisory capacity. The result of this condition is shown by the testing plants and laboratories maintained by many of the parts manufacturers. For instance, the manufacturers of radiators to-day are no longer asked to build a radiator according to certain exact specifications, but often are given merely the outline, the location of inlet and outlet castings and engine dimensions and asked to design a radiator to cool efficiently. I believe that a great deal of annoyance could be avoided if this idea were put more into practice, as it is certainly reasonable to suppose that an organization which spends its entire time on practically one subject should be better posted on this subject than the man who designs one or possibly two radiators a year. This calls for a full knowledge of not only the radiating efficiency of one's own type of radiator, but also of the various other makes in use as well as complete data relative to the entire question of cooling gasoline motors. The lack of information on these subjects even by the best posted automobile builders has been surprising, and now that there is a decided tendency toward the use of the thermosiphon system of water circulation, the need for a thorough knowledge of the subject is greater than ever.

Another matter of great importance is the testing of the product by the parts manufacturers before delivery to the automobile makers, as nothing disrupts an organization and delays an output so much as the necessity for returning parts on account of defects, even though they may be minor ones. One of the greatest single items of expense in the production of such parts as lubricators and radiators is this item of testing, as the system maintained must be thorough and to a certain extent elaborate. A great many automobile builders would be very much surprised to know the expense of testing radiators, to make certain that they are absolutely tight before they are applied to the customer's car.

The ultimate result, of course, will be a greater degree of co-operation between the motor-car builders and the parts makers, and it is plain to see that this is a most desirable condition. There are many parts which probably always will be made by factories independent of the automobile factories, as unquestionably the specializing induced by this condition permits of decidedly better results. The parts makers view the situation from this standpoint and are laying their plans and establishing their factories and organizations accordingly.

HEAVY CARS STILL MUCH FAVORED

CLEVELAND, Oct. 4.—The growing popularity of light cars has failed to convince George J. Dunham, president of the Royal Tourist Company, that this type is superior to the heavy models, and this company will continue in 1910 to be one of the few in this country which has not brought out a car of light, or, at any rate, medium weight. The 1910 Royal Tourist, designated Model M, Series Two, will have a 5 1-2 by 6-inch motor, rated at 48.4 horsepower, and claimed to develop 65. There have been but few changes; the motor is the same, with the exception of the oiling system, which is of an improved circulating type. The hood has been lengthened and the dash is now square. Alloy steel is used for the frame, axles and gears, and by improved methods of construction it has been found possible to build a large seven-passenger car of comparatively moderate weight and capable of economical operation. Preparations are being made at the Royal Tourist factory to meet a heavy demand.

PARTS FACTORIES WILL BE ILLUMINATED AT NIGHT

By P. L. BARTER, SALES MANAGER McCORD MANUFACTURING COMPANY.

The enormous and marvelously quick growth of the automobile business is a topic of interest throughout the whole country, but in Detroit the situation is more focused in the public eye than elsewhere owing to its increasing number of factories.

This situation provides a greater problem for the parts makers than for any one else in the business, due to the fact that a majority of the cars produced during the next year will be wholly or partially assembled, and that in very few cases will all the complete parts be built in one factory. There are, of course, many parts of an automobile that cannot be produced by inexperienced manufacturers, and so as a matter of fact the output of cars to a large extent will depend upon the output of the factories of the established makers of standard parts.

The ability to "deliver the goods" is the main factor in this business to-day, and it is reassuring to note that the leading manufacturers of parts have anticipated this situation by adding to their factory space and equipment to care for the increasing demand. That the "live people" are meeting the situation satisfactorily is undoubtedly true, and the wise and well-organized concerns are only taking on such business as they can actually produce.

That there will be any serious famine is doubtful, but that the parts factories throughout the country will be illuminated at night for the next twelve months is unquestionably a fact.

On the whole, never has the outlook been as favorable as at present, and while there are murmurs of future disasters from the ever-ready pessimists, those who undoubtedly are closest to the great buying public tell us that the upward wave will not reach its crest for the next two or three years, and by that time the situation will have been thoroughly clarified and reduced to an ordinary basis.

The more the sane business side of this great industry is accentuated in the press and in the mouths of those composing the trade, and the less stress is laid upon its quick profits and spectacular features, the more quickly will come the result we all anticipate and desire. We believe that even the advertising should reflect a spirit of conservatism and careful business forethought, tending to more and more spread a belief in the stability of the entire industry.

QUAKERTOWN'S P. O. EMPLOYS AUTOCARS

PHILADELPHIA, Oct. 4.—On Friday last the local post office authorities put into commission five Autocar motor trucks, to be used in collecting mails in the northern and western sections of the city. So promptly and thoroughly was the work done on the first two days that the postal officials are delighted. The new deal throws nine horse-drawn teams out of commission, and if the results of the first few days' operation are continued for a reasonable length of time, the motor truck collection service will be considerably extended. It is understood that the government is paying \$3,000 per annum for each truck with its driver.

POPE MFG. CO. REPORTS PROGRESS

HARTFORD, CONN., Oct. 2.—The report of the reorganized Pope Manufacturing Company, of this city, shows that during the period from December 24, 1908, to July 31, 1909, the net earnings of the company have been \$482,866. Under the heading of assets is listed real estate, equipment, plant and patents totaling \$5,194,835. The total assets of the company approximate \$6,910,414. Only the factories at Hartford and at Westfield, Mass., have been operated. A new branch of the business, the building of automobile ambulances, patrol wagons and fire equipment, has proved very profitable.



Pole Discoverer Cook Receiving Ovation in Boston

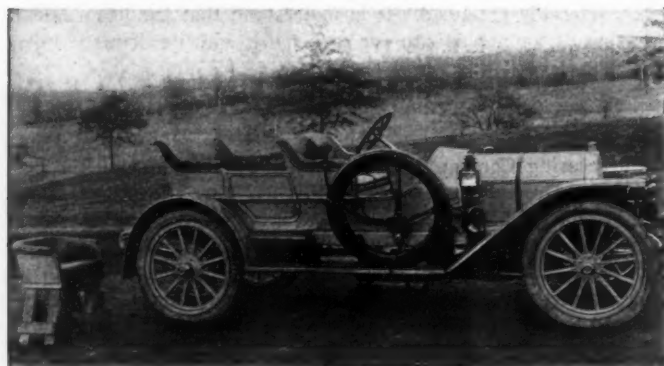
On the occasion of Dr. Cook, the successful Arctic explorer, visiting Boston to deliver his lecture at Symphony Hall, he was driven around in a Thomas car by C. S. Henshaw, manager of the Thomas Boston branch. Another Thomas followed with the reception committee. During the whole of Dr. Cook's week of lecturing he will be driven around in Thomas cars, arrangements having been made to have a car of that make meet him at each stop.

TO STOP JOY-RIDING AND RAKE-OFFS

PHILADELPHIA, Oct. 4—With a view of putting a stop to "joy-riding" and "rake-offs," a number of prominent local garage owners met last week and formed an organization under the title of Philadelphia Garage Association. Stringent by-laws were unanimously adopted, among them being one providing for a fine of \$25 for any member who shall pay a commission to a chauffeur, failure to pay which subjects the offending garage to suspension from membership. Another rule provides that upon request a member will furnish to any patron a complete daily record of the movements of his car during the preceding month. An employment bureau, through which the clientele of members of the association will be furnished with competent chauffeurs upon the payment of a small fee, has also been established.

LATEST COLUMBIA SHOWS CLASSY BODY

Among the newer bodies and color schemes none shows more attractive lines than the newest product of the Columbia Motor Car Company, whose big plant at Hartford, Conn., is very busy in a quiet way turning out the rejuvenated Model 29. The latest form which this takes is the short chassis with toy tonneau, double or single rumble. All three of these are interchangeable, as the picture shows. This represents a toy tonneau, but beside it on the ground is placed a single rumble, which may be substituted for the tonneau in the length of time it takes to tell it. This particular body was done in a light gray, striped a lighter green, and upholstered in dark green. The whole effect is very attractive, as are also all of the other color tones, most of which show a tendency towards gray and the lighter colors.



Latest Columbia is a Nattily Designed Runabout

TIRE OUTPUT WILL TOTAL THIRTY MILLIONS

"The tire output of this year will total nearly \$30,000,000," declares H. S. Firestone, one of the best informed authorities on the subject, "and next year's production is expected to run between \$45,000,000 and \$50,000,000."

The rubber harvest has averaged an annual increase of only about 11 per cent. for several years, which is barely enough under normal conditions to keep pace with general business requirements. It is owing principally to the recent large demand and to local conditions in the rubber districts that fine Para rubber has steadily risen from 67 cents a pound in February, 1908, to the record price of \$2.15 which now prevails for immediate delivery. There is very little to be had even at that price.

"Most of the rubber used comes from the Para district, up the Amazon River, where it is harvested wild, and from Ceylon, where it is gathered from extensive plantations. Some rubber comes from Mexico, Africa and parts of South America outside the Para district, but this is of inferior grade and the automobile world will eventually have to look to the rubber plantations to supply a large portion of the extraordinary amount required in the manufacture of high-grade tires."

DETROIT'S BIG LITTLE SHOW

DETROIT, Oct. 4—January 24-29 are the dates selected by the Detroit Auto Dealers' Association for the biggest little show in the country. This year, as last, the show will be held at the Wayne Pavilion, and it is planned to make it even more representative than in the past.

Those who witnessed last year's exhibition will realize that when the association announces its determination to make the forthcoming show bigger and better than ever it will have to go some. Manager E. LeRoy Pelletier last winter evolved a show that was an eyecopener even to New York and Chicago, and in point of beauty had no rival. Just what the dealers have up their sleeves is not disclosed at this time, but something new and novel is promised.

John Gillespie, one of the most active members of the local motoring colony, and well remembered by Glidden tourists and others as secretary of the entertainment committee that made life pleasant for participants in the big A. A. A. tour before leaving Detroit, will act as manager of the show.

STUDEBAKER MANAGERS CONVENE

SOUTH BEND, IND., Oct. 2—Twenty-four Studebaker branch managers spent the past week in their annual convention at this city. A tour of inspection was made through the carriage and wagon factory. This plant covers an area of two square miles and the trip covered a distance of about 24 miles. As it was impossible to make such a journey on foot, a number of Studebaker electric cars were pressed into service for use in the corridors of the buildings. In this way the trip was made in a single afternoon with ample stops for inspection. A trip was also made to Detroit to inspect the plants in which are made the Studebaker-E. M. F. and the Studebaker-Flanders and from there the party went on to Elyria, O., to see the Studebaker-Garford factory. It is said that the combined Studebaker interests will make and sell 40,000 cars during 1910.

LATEST NEWCOMER FROM DETROIT

DETROIT, Oct. 4—The Paige Detroit Motor Car Company has been organized, and it is announced that by December 1 the new car will be on the streets ready for delivery. Fred O. Paige, for some time identified with the Reliance Motor Car Company until its absorption by the General Motors Company, is president and general manager of the new concern; Willis Buhl, vice-president; Gilbert Lee, treasurer, and William B. Cady, secretary.

The company will manufacture runabouts selling for \$800, and will introduce several revolutionary features. Chief of these will be a two-cycle three-cylinder motor.

Told in the Progress of the Industry

Oakland Increases Stock—Continuing the policy of the General Motors Company, as illustrated in the recent doubling of the capital stock of the Olds Motor Works, the capital stock of the Oakland Motor Car Company, of Pontiac, Mich., has been increased from \$300,000 to \$800,000. A question has been raised by the Secretary of State of Michigan as to whether the General Motors Company can legally do business in that state, and an investigation is being made by the Attorney-General. It is doubtful whether the laws permit holding companies to own the stock of Michigan corporations. At any rate it is contended that the state is entitled to a franchise fee from the company.

Needless to say, if this view is upheld it will have a far-reaching influence on future combinations, and this phase of the industry is of growing importance.

Tires in the L. I. Derby—Chevrolet's non-stop record in the Riverhead race was in some measure due to the performance of the Michelin tires with which his car was equipped. The first three cars to finish in the big car race, De Palma's Fiat and Disbrow's and Lund's Rainiers, were also fitted with Michelins. Only two Michelins were changed in the entire race, and those because of punctures caused by horseshoe nails. Ajax tires were used on the Maxwell cars driven by See, Costello and Doorly in the small-

car class, finishing first, second and fourth, respectively. All three sets were in excellent condition at the finish, no punctures or other trouble having been reported.

Erie Hammer the One Used—In the description of the equipment of the new addition to the Rambler factory at Kenosha, Wis., in *The Automobile* of September 23, page 535, the name of the steam drop-forging hammer and its makers, the Erie Foundry Company, of Erie, Pa., was inadvertently omitted. This company, in addition to its extensive line of steam hammers and shearing machinery, traveling grates and stokers, makes a specialty of castings and finished automobile cylinders exceptional in character which are meeting with great demand from the manufacturing trade.

Stepney Now Makes Rims—The American Stepney Spare Wheel Company, of Chicago, is utilizing part of its new plant to turn out in quantities its improved standard clincher rims. These rims are copper-plated and are said to be considerably stronger than the usual type. A large supply is being carried on hand for immediate delivery, both in Chicago and at the New York branch, 1773 Broadway. Samples will be sent to the trade on request.

Osborn Foundries Reorganized—The Osborn Foundry Company, of Detroit, has been reorganized under the name of the Osborn Electric Company, but will continue to manufacture the same line of magnetos, batteries and coils. This move provides a broader plan, larger capitalization and better facilities. The assets of the old company have been included in those of the new, and its liabilities have likewise been assumed.

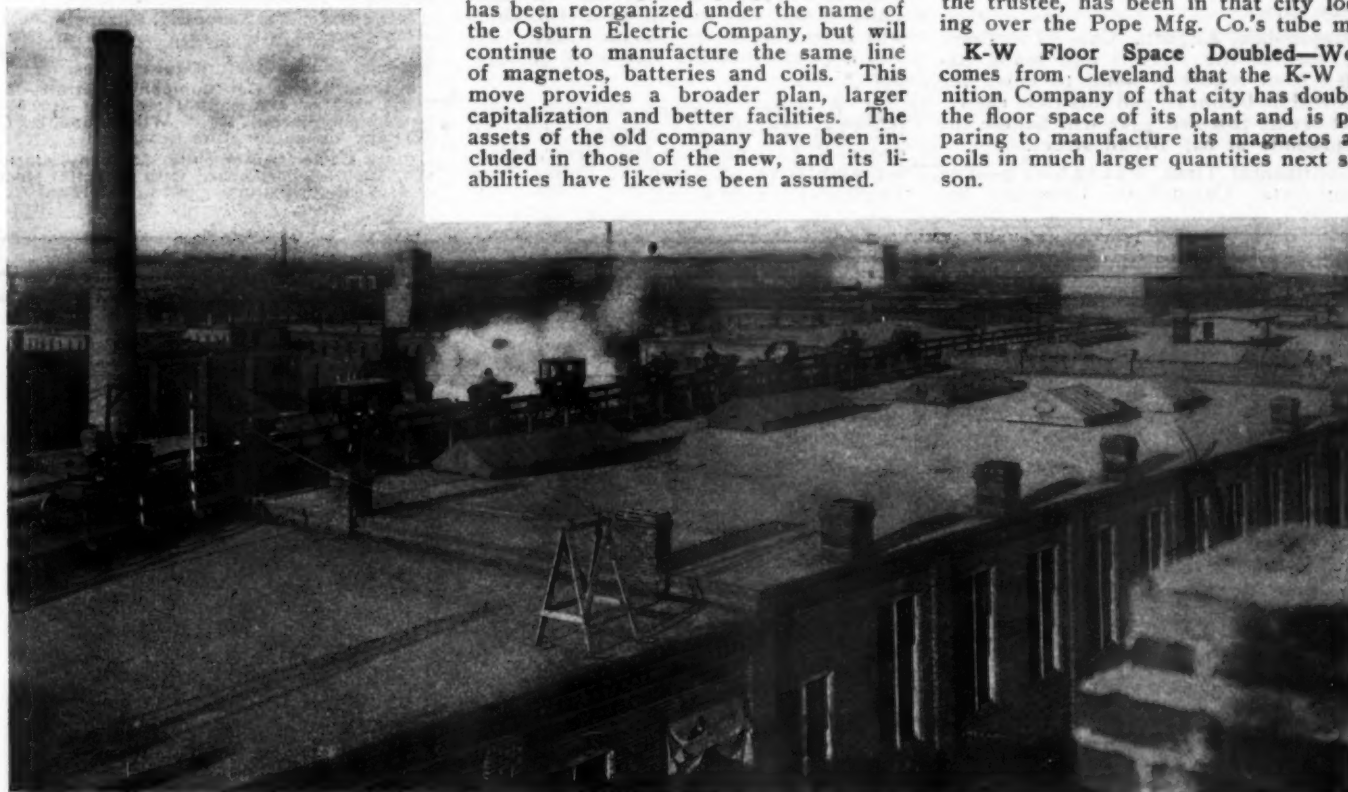
Change in Forging Company—The Lakeside Forge and Wrench Company, of Springfield, Mass., has acquired the plant of the Springfield Drop Forge Company, and began operations there with a full force of men on September 27. Eugene Childs, formerly connected with the Trimont Mfg. Co., of Roxbury, Mass., will be president and general manager of the company.

Studebaker's Foreign Log-Books—For the benefit of Americans who wish to tour in Europe, the Studebaker Automobile Company is publishing a log-book containing an illustrated description of the extensive trip recently made "on the other side" by Walter Hale. The contents include road maps, distances, and information as to taxes, passports, fees, etc.

Detroit Headquarters for "The Automobile" and "Motor Age"—H. H. Gill, advertising representative of the Automobile and "Motor Age," has opened up commodious Detroit offices in the Majestic building, which, in view of its central location, is the place of call for the fraternity at large when sojourning in Detroit.

Re-Financing of the Berkshire—The Berkshire Motor Car Company, of Pittsfield, Mass., which went into bankruptcy during the panic, has been reorganized with a capital of \$120,000, and may locate in Hartford, Conn. John McQuade, the trustee, has been in that city looking over the Pope Mfg. Co.'s tube mill.

K-W Floor Space Doubled—Word comes from Cleveland that the K-W Ignition Company of that city has doubled the floor space of its plant and is preparing to manufacture its magnetos and coils in much larger quantities next season.



Inspection Tour of Studebaker Branch Managers of the Big Factory Plant at South Bend, Ind.

While apparently traveling over roofs, the cars pictured are carrying the Studebaker branch managers on a tour of inspection through the mammoth plant at South Bend, Ind. On this trip, a distance of 24 miles is covered through every floor and over a system of tramways, which run over the roofs and connect the various buildings. The cars are shown on one of the tramways.

IN AND ABOUT THE AGENCIES

New Moon Agencies—The following new agents have been appointed by the Moon Motor Car Company: Motor Sales Company, Washington, D. C.; Moon Car Agency, Tampa, Fla.; City Garage, Springfield, Ill.; Keller & Company, Edwardsville, Ill.; E. H. Wilson, Bartlett, Tex.; Duff & Company, Nebraska City, Neb.; Stearns Automobile Company, Los Angeles, Cal.; T. J. McConnell, Atlanta, Ga.; J. Wills, Des Moines, Ia.; C. L. Baker, Holyrood, Kan.; W. C. Ballard & Company, Oklahoma, Okla.; J. H. Monner, Aurora, Neb.; Hill Storage & Implement Company, Burlington, Vt.; Segerstrom Automobile Company, Minneapolis, Minn.; J. Pumphrey, Memphis, Tenn.; R. T. Jones, Ballinger, Tex.; C. Krumsick, Washington, Mo.

Oldsmobile and Oakland, Pittsburg—The Federal Motor Car Company has been appointed exclusive agent for the Oldsmobile and Oakland in Western Pennsylvania, West Virginia and Maryland, and has taken over the former quarters of the Oldsmobile Company at 5922 Baum street. J. H. McClarren is president of the company and A. M. Brown, manager.

More Hupmobile Agencies—The following sub-agencies for Ohio have been placed by C. Roy Clugh, manager of the Columbus branch of the Charles Schiear Motor Car Company, State agents: Newark, G. D. Heisy; Springfield, L. E. Bauer; Greenville, Swope Music Company; Dayton, A. H. Pearsen, at the Central Garage.

Studebaker, Brooklyn, N. Y.—The interests of the Studebaker Companies will be looked after in this borough by the Carpenter Motor Vehicle Company, 1239 Fulton street. A number of changes have been made in the building to provide an attractive home for the Studebaker cars.

Hupmobile, Augusta, Ga.—"Ty" Cobb, the star of the Detroit ball team, has often been reported about to enter the automobile business, and this time the report seems justified. He will handle the Hupmobile at 647 Broad street.

Continental Tires, Pittsburg—The Continental Caoutchouc Company an-

nounces that its tires and rims will henceforth be handled in Western Pennsylvania by the Jos. Woodwell Company, 203 Wood street, Pittsburg.

Overland and Marion, Oakland, Cal.—Messrs. Tallman and Stephenson are to act as agents for the Overland and Marion cars, as well as for the California-built Sunset, with headquarters at 310 Twelfth street.

Pullman and Keystone, Houston, Tex.—The Imperial Motor Car Company has been organized to hold the Pullman and Keystone agencies in this city, and will locate at Prairie and San Jacinto streets.

Selden, New York City—In the future the Selden car will be handled in the metropolitan district by the Cloud-Marts Company, and a salesroom will be opened at 1871 Broadway.

Chalmers-Detroit, Burlington, Ia.—The local agency will in the future consist of John P. Sheagren and W. B. Hunt, who have also secured the agency for the Hudson runabout.

PERSONAL TRADE MENTION

E. M. West, known in trade circles as former automobile editor of the New York Times, and later as advertising manager of the Harry S. Hought Company, has taken charge of the New York office of the H. L. Hornberger Advertising Agency, of Philadelphia. He is now located at 2010 Broadway.

Henry Goodman, for a number of years the Eastern traveling representative of the Waverley Company, has engaged with the Buick Motor Company. He will be attached to the commercial department of the New York branch.

C. C. Hildebrand, sales manager of the Stevens-Duryea Company, of Chicopee Falls, Mass., has started on a trip which will take him to the Pacific Coast. He will not return to the East until November.

R. B. Eifer, formerly salesman with the Flint Motor Car Company, of Providence, R. I., is now the Fall River, Mass., representative of Alvan T. Fuller, New England Packard agent.

D. T. Keenan has joined the Hart-Kraft Motor Company, of York, Pa., manufacturer of commercial vehicles, as salesmanager, his appointment to take effect immediately.

George L. Bixby has entered the service of the Overland Automobile Company, of Indianapolis, as secretary to W. H. Brown, the manager of the Indianapolis factory.

Weldon A. Fosdick is now salesmanager of the Moline Automobile Company of Texas, located at Dallas. He was formerly connected with the Maxwell Company.

J. V. Carr has accepted the position of salesmanager with the Fuller Power Truck Company, of Delphos, O., manufacturer of four-wheel drive trucks.

RECENT INCORPORATIONS

Tate Gas-Electric Motor Vehicle Company, Jersey City, N. J.—Incorporated with a capital stock of \$100,000, by J. L. Tate, C. E. Tate and J. L. Tate, Jr., all of Jersey City, to manufacture automobiles, motor boats and aerial machines.

The Leech Automobile Company, Trenton, N. J.—Incorporated with a capital stock of \$500,000, by C. A. Bliss, of Toledo, O.; J. P. Le Fevre, Dover, Del., and C. H. Le Fevre, Smyrna, Del., to manufacture automobiles.

De Schaum-Hornell Motor Company, Buffalo, N. Y.—Incorporated with a capital stock of \$150,000, by W. A. De Schaum, W. C. Paul, R. H. Lincoln and H. J. Hopkins, to manufacture gasoline motors.

Metzger Motor Car Company, Detroit—Incorporated by W. E. Metzger, B. F. Everitt and W. F. Kelly, with a capital of \$500,000, of which \$300,000 has been paid in, to manufacture automobiles.

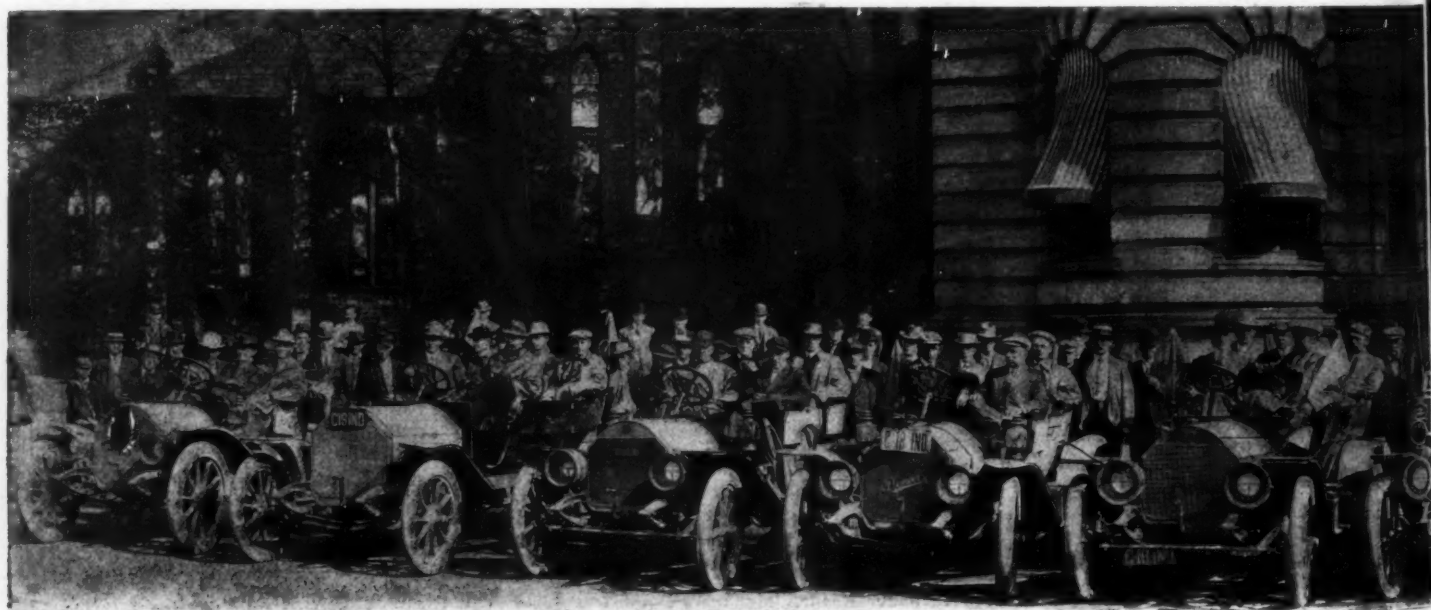
Commercial Car Company, Keyport, N. J.—Incorporated by G. F. Smith, P. and W. Cherry and C. Russell, with a capital of \$125,000, to manufacture automobiles and motor boats.

Croxtan-Keeton Motor Company, New York City—Incorporated by H. A. Croxtan, J. P. Stoltz and W. D. Grand, with a capital of \$60,000, to manufacture and sell automobiles.

Mono Motor Car Company, Elizabeth, N. J.—Incorporated with a capital stock of \$300,000, by W. H. Wood, H. T. Eaton and Charles Roberts, to manufacture automobiles.

Warren Motor Car Company, Detroit—Incorporated with a capital stock of \$100,000, by Homer Warren, C. R. Wilson and H. C. Walters, to manufacture automobiles.

Clark-Carter Automobile Company, Jackson, Mich.—Incorporated with a capital stock of \$100,000, to manufacture automobiles.



Premier Agents, Thirty-two in Number, Representing Every Large City, Being Entertained on Sight-Seeing

GOODRICH COMPANY'S NEW YORK STORE

One of the most admirably equipped buildings for the handling of rubber products, especially tires, has just been finished by the B. F. Goodrich Company, of New York, at 1780-1782 Broadway. The structure is a notable addition to the business buildings of the neighborhood in which it stands, on Broadway next to the corner of Fifty-seventh street, and it has an ell of almost equal size at 225-227 West Fifty-seventh street. There are twelve floors and a basement. The latter is used entirely for the storage of tires. The rear of the ground or street floor is a receiving and shipping room. The front is a large salesroom, which has been very effectively done in mahogany, and green marble is also an element of the finish. It has been chosen for the counter tops and the heavy pillars that support the ceiling.

On the second floor, looking out on Broadway, is the reception room—a considerable provision for the comfort of customers who may be awaiting attention. There are large easy chairs, smoking tables and convenient writing desks. The finish here is fumed oak. A rear room is reserved for the solid tire storage and repairing. Here is a complete wheelwright and forge equipment, so that all tire fitting can be done, as well as the repair work.

The eighth floor has been given over mostly to offices for the manager and salesmen. The rear is a storeroom for the stock of mechanical rubber goods. Above, on the ninth floor, are the general offices for the clerks.

The next floor, for the company's use, is the eleventh—a large stock room for specialties such as druggists', surgeons' and stationers' rubber sundries.

On the top, or twelfth, floor are the most complete automobile tire repair facilities in the United States.

Throughout this building, seemingly, no mechanical device for the ready handling of the heavy stock has been omitted. There are special automobile elevators. One of these has the convenience of a turn-table floor. There is also a general freight lift. In addition, two passenger elevators are provided, and an electric dumbwaiter, adjusted to stop automatically at any floor.



Goodrich's New Metropolitan Home

The exterior of the building is white and green marble, with bronze capitals and decorations for the first two stories. Above this the material is pressed brick with white stone trimmings.

The combination is effective and distinguishes the building as a conspicuous achievement. W. H. Yule is general manager, with H. C. Miller in charge of the automobile tire department.

HAWS WINS RIGHT TO NAME PANHARD

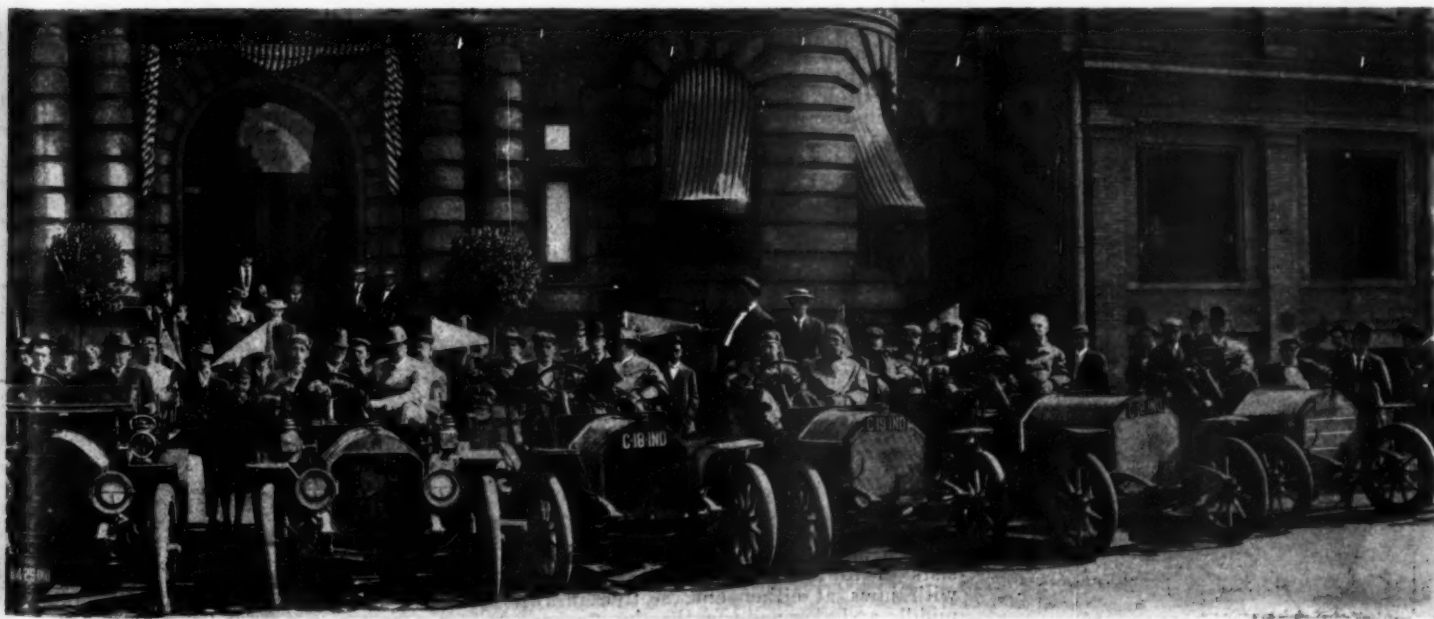
In Part IV, special term of the Supreme Court of New York, Judge McCall has just rendered a very important decision. This was in the case of Geo. A. Haws versus the H. T. Alexander Company, both of New York City. The cause of the suit was the name of an oil, Haws having brought out an oil which he called Panhard. This, as brought out in the trial, was in 1901. In 1907, Alexander also brought out a Panhard oil, and was soon sued by Haws. After much litigation the case was finally settled by Judge McCall's decision, which was to the effect that Haws alone had the right to use this name in connection

with lubricating oils. One very important point to the trade at large brought out by this suit is that a car manufacturer has no right to this same car name when applied to some other object or substance. This point was brought out when Judge McCall ruled out the testimony to the effect that Haws had a license from Panhard & Levassor. The judge ruled this testimony out as having no relevancy or effect. The ruling, in part, was:

"While some proof was offered on the part of the defendants to establish their prior use of the name, to say the least about it, it falls far short of the force requisite to give it any convincing power, and I believe the fact to be that the defendant did not use this designation until 1907, some three years after the plaintiff had been serving the trade with 'Panhard oil' and expending their energies and capital to establish it as a foremost factor in the trade. While I admitted the proof of the issuance of a license to defendant by the manufacturers of the Panhard car to use the name 'Panhard,' it has no relevancy to this case, and does not affect the question one way or the other. Judgment must, therefore, be rendered, granting the injunctive relief prayed for, and accounting must be rendered of the sales made by the defendant under the name 'Panhard.' Findings to be submitted."

RECENT TRADE PUBLICATIONS

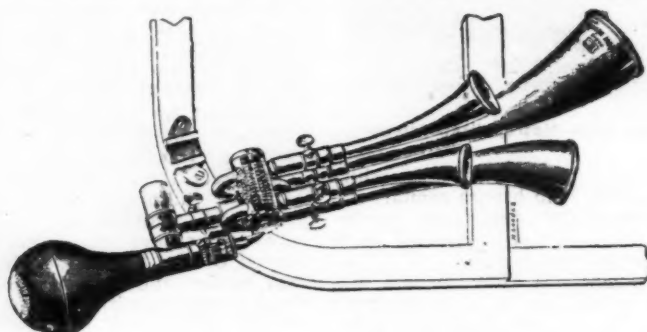
The New Era Gas Engine Company, Dayton, O.—The latest type of motorcycle manufactured by this company is an automobile in every respect except the number of its wheels. The bicycle pedals and saddle have been replaced by a footboard and a comfortable formed seat; the motor is started with a crank, and drives through a two-speed planetary gear. The gears and the brake are controlled by automobile-type push pedals on the footboard. The motor develops 3½ horsepower, its cylinder dimensions being 3¼ and 3½-in. bore and stroke, respectively. Wheels are 28-in. in diameter, with 2¼-in. tires, and the wheelbase is 60 in. The merits of the New Era are set forth in a 16-page catalog, illustrated with clear half-tones of the machine, its motor and special features, which in turn are well explained by the text.



Trip to French Lick Springs, Ind., Upon the Occasion of the Annual Agents' Convention at Indianapolis

Information for Auto Users

The Musical "Testophone"—This French device is one of the latest ideas in the signaling line, and has the merit that, unlike most of the recent products in this line, its sound is really pleasing, and does not cause shivers to run up the spine of the inoffensive pedestrian.



THE LATEST FRENCH MUSICAL HORN IS CALLED "TESTOPHONE"

The Motor Car Equipment Company, of 55 Warren street, New York, which sells it in this country, says that it has made more friends in the short time it has been on the market here than any other device, and the friends are not numbered among the automobilists alone. Not only is it an effective warning instrument, but its bugle calls are novel and pleasing. It resembles an ordinary bulb horn in its operation, but has four reeds, each with its separate trumpet. Each time the bulb is pressed a piston arrangement actuates a ratchet wheel at the base of the horn, revolving a valve which directs the air to the various tubes in turn. The effect of pressing the bulb lightly a number of times in rapid succession is to give a fanfare

closely resembling a bugle call, as the different notes of the group are sounded in sequence and sometimes in combination. The combinations can be controlled and varied at will by adjusting the valve. The horn is 26 inches in length and is finished in brass.



HOFFEKER SMALLER MODEL SPEEDOMETER.

1910 Hofferker Speedometer—Still using for its watchword the phrase "The Steady Hand," the Hofferker Company, of Boston, has brought out 1910 models of its speedometers, differing from former designs only in detail refinement. All the three styles use identically the same speed-indicating movement, which is that always known under this name. It is of the centrifugal, flying-ball governor type, in which the indicating hand is actuated through an irreversible device which prevents any movement save those caused by variations in the speed of the car. The smallest model has a 3-inch dial, graduated to 50 miles, and to save expense a Veeder odometer is used, carried beneath the dial; it registers to 100 and 10,000 miles respectively on the trip and season indicators. A larger and more expensive model has a 3 1/2-inch dial, graduated to 60 miles, and the odometer, of Hofferker construction, is incorporated in the body of the instrument. On this the trip mileage is registered on a circular dial concentric with that indicating the speed, by means of a moving hand; the season register shows figures in the usual manner. This large instrument is also made in combination with a Chelsea clock, in a circular case similar in size and shape to that of the speedometer, and is provided with an electric light between the two dials.

Ronson Pocket Wrench—"Nine wrenches carried in the vest pocket" summarizes this clever device. With a length of 6 inches and a weight of 8 ounces one may have nine wrenches, ranging in size from 3-16 to 13-16 inch, a perfect substitute for a set which ordinarily would weigh 5 pounds and take up half a tool-box. The "Ronson" consists of four thin plates of steel, each with jaws at either end, slotted in the middle and clamped together by a square bolt passing through the slot. By loos-

ening a wingnut any desired member can be slid out into working position, leaving the other members to form a handle and give greater leverage. As the members must be very thin, they are made of plate steel, carefully heat-tempered. The center bolt and wingnut are drop-forged. The thinness of the members is in itself claimed to be an advantage, as it enables the wrench to be used in places where an ordinary type of wrench could not be applied. The finish is



RONSON VEST POCKET WRENCH.

nickel. Cryder & Company, Park avenue and Sixty-third street, New York City, hold the exclusive selling agency.

Carborundum Grinding Compound—Formerly carborundum powder has only been available in the dry state, and when used for grinding in valves it has been necessary to mix it with oil or grease. Naturally, the mixture was often done by guesswork, and the results were not always what may have been desired or expected. To obviate this objection the Carborundum Company, of Niagara Falls, N. Y., which makes carborundum powder, grinding wheels, etc., has brought out a ready-to-use valve grinding compound, which consists of a suitable grade of carborundum powder mixed in the proper proportion with a high-grade grease. The compound is put up in a handy little case, which contains two collapsible tubes, one of coarse compound and one of the finer grade, and also a package of carborundum cloth strips for cleaning vibrator and contact points, and a book of carborundum cloth for general use. For those who have acquired some degree of skill in the mixing process and wish to mix their own compound, another kit is offered, containing two quarter-pound cans of dry powder, coarse and fine, as well as the cloth strips and book. It is claimed that the work can be done with this material quicker than with glass or emery, and that a better valve seat is secured.



LARGER SPEEDOMETER INCLUDES ODOMETER.